COPPERSTRING 2032

COPPERSTRING 2032 JV

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

COPPERSTRING 2032

EDMS No : CSPW-EVN-PLN-900-000005
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Approvals and Reviews

Construction Environmental Management Plan	
Project	CopperString 2032
Client	Powerlink Queensland Pty Ltd
Document Number	CSPW-EVN-PLN-900-000005

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A02	Updated in response to comments	Jacinta Fuller	David Mclean	Michael Dawson	06/06/2024

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1. Introduction

The purpose of the CopperString 2032 project is to connect the North-West Minerals Province (NWMP) of Queensland to the National Electricity Grid. This will not only allow existing loads in the Mt Isa and Cloncurry areas to be fed from the National Electricity Market (NEM), but also provide access to new mining loads and opportunity for connection of renewable generation.

1.1 Project scope

The CopperString 2032 Project is an extra high voltage transmission system intended to connect the North-West Power System (NWPS) near Cloncurry and Mount Isa to the Powerlink network and NEM at Mulgrave. Figure 1 provides an overview of the Project.



Figure 1 CopperString 2032 proposed transmission lines and substations

The CopperString 2032 Project will connect the NWMP to the NEM to reduce the cost of power supply and facilitate the large-scale development of the Hughenden wind resource and solar resources within the North Queensland Clean Energy Hub (NQCEH). The scope of work, traversing east to west, consists of the following sections:

- Mulgrave 500/275kV Substation as the CopperString 500kV connection point to the Queensland SuperGrid and 275kV line augmentation as the CopperString 275kV connection point to the NEM
- Pentland 500kV Substation to support the North Queensland Clean Energy Hub (NQCEH) expansion and as the core for future load connections in the area
- Flinders 500/300kV Substation (Hughenden) as the core for the NQCEH
- Dajarra Road 330/220kV Substation (Cloncurry) as the core for distributions to larger load centres
- The primary CopperString transmission backbone
- Termination via the Mount Isa augmentation 220/132kV.

The scope consists of a transmission line between the above locations carrying extra high voltage power transmission at 500kV, 330kV and 220kV respectively. Substations at the abovementioned interconnecting junctions will distribute power to the NWMP and NQCEH.

Ancillary project scope addressed by this CEMP includes:

- Road infrastructure (new and upgrades)
- Infrastructure (road, rail and existing distribution lines) and watercourse crossings
- Accommodation hubs (temporary) at 6 sites inclusive of:

- Office facilities and car parking
- Motor vehicle workshop (with oily water separator)
- Mobile and temporary concrete batching plants
- Laydown for storage of product
- Designated areas for waste areas and environmental supplies
- Washdown bay
- Sewage (wastewater) treatment plant and irrigation areas (contingency and dependent on mains connection and local capacity)
- Water treatment plant and bore (contingency and dependent on mains connection and supply availability)

- Water (construction and drinking water), power and gravel sources.

1.2 Project description

The key characteristics of the project are detailed in Table 1.

Table 1 Project Details

Project Component	Description
Client	Powerlink Queensland (PQ)
Project Type	EPC
Location	Five individual substation sites located between the proposed Mulgrave substation to the east and the proposed Mount Isa substation to the west plus approximately 1000KM of overhead powerlines (with towers appropriately spaced)
Land Tenure	Freehold and leasehold
Historical	Pastoral, defence force and mining
Zoned	Rural
Project Working hours	Monday to Sunday 6am to 6pm
Project Duration	3-5 years
Project Commencement	TBC

1.3 Environmental settings

The five substation sites within the project scope and interconnecting transmission line locations are:

- Mount Isa Substation
- Flinders Substation
- Darjarra Road Substation
- Mulgrave Substation
- Pentland Substation.

Details of the environmental setting and issues that may influence or impede the project are detailed in table 2.

Table 2 Environmental attributes

Project Component	Description
Site Description	The sites encompass numerous bioregions predominantly featuring land used for rural purposes such as grazing and cattle breeding. Up to 25 major watercourses are likely to be crossed along the project easement with an addition 60 minor water courses also intersecting the easement, many of these are crossed multiple times. An array of Matters of National Environmental Significance (MNES) are also present along the alignment including, threatened flora, threatened fauna and migratory species. Of these, only 3 threatened flora species and 10 threatened fauna are identified as either confirmed present or likely to occur. • Black ironbox (*Eucalyptus raveretiana*) • Waxy cabbage palm (*Livistona lanuginose*) • Pink gidgee (*Acacia crombiei*) • Squatter pigeon (southern) (*Geophaps scripta scripta*) • Koala (*Phascolarctos cinereus*) • Black throated-finch (*Poephila cincta cincta*) • Julia Creek dunnart (*Sminthopsis douglasi*) • Red goshawk (*Erythrotriorchis radiatus*) • Night parrot (*Pezoporus occidentalis*) • Painted honeyeater (*Grantiella picta*) • Australian painted-snipe (*Rostratula australis*) • Ornamental snake (*Denisonia maculata*) • Plains death adder (*Acanthophis hawkei*) Additional threatened species, including migratory species have potential to occur. The local government area's the project alignment traverses are the Burdekin Shire Council, Charters Towers Regional Council, Flinders Shire Council, Richmond Shire Council, Cloncurry Shire Council, McKinlay Shire Council and Mount Isa Shire Council.
Topography & Landform	The CopperString 2032 project spans across six bioregions with each one capturing a unique largescale geophysical pattern. The Bioregions located across the project and some main characteristics of each zone are summarised below: Brigalow Belt: The Brigalow Belt/Einasleigh Uplands portion of the project is characterised by portions of rugged ranges and sections of alluvial plains ranging from approximately 80 m Australian Height Datum (AHD) up to 420 m AHD. Einasleigh Uplands: characteristics are similar to the Brigalow Belt portion of the project and summarised above. Desert Uplands: The Desert Uplands section covers approximately 200km of the project and consists of upland landforms, sandstone ranges and sandstone plains. Included in the Desert Uplands zone are some large river systems including Balfe Creek and Torrens Creek and it also crosses the Great Dividing Range. Mitchell Grass Downs: The Mitchell Grass Downs bioregion is located to the south of the Flinders Highway and covers a larger portion of the corridor than any other region. This bioregion contains large grass covered plains with a sparse spread of trees, sporadic ridges, gorges and includes numerous creek and river systems, some of which are a part of the Flinders River catchment. This section generally sits around 140 m AHD. Gulf Plains: The Gulf Plains bioregion compromises of flat to gentle undulating alluvial clay deposits and sporadic deep depressions capable of holding water for short periods of time. The primary feature of the Gulf Plains is the network of channels which form a part of the Flinders River catchment. Northwest Highlands: The western corridor of the project and southern spur lines comprise of the Northwest Highland bioregion which consists of undulating ground with steep ridges, plateau's, narrow river valleys and alluvial clay plains. The southern section of this bioregion includes the Selwyn ranges before opening into areas of flatter sections leading into the Mitchell Grass Downs bioregion. Elevations in the Northwest bioregion are as high as 570 m ADH.
Climatic Conditions	Due to the vast distance the project is located over, climates are markedly varied between sites. Listed below are some of the extremities within the project area: Wettest Month – January (mean 160mm +)

Project Component	Description
	Driest Month – August (mean 3.7mm) Hottest Month – December (mean max 38.5) Coolest Month – July (mean min 10.6) Three climatic zones have been identified across the project: Coastal lowlands – typified by tropical climate with monsoonal summers which are hot and humid and consists of an afternoon sea breeze. On average this zone receives approximately 1,000mm of rainfall a year, mostly over the summer months. Great Dividing Range – this zone is immediately to the west of the coastal lowlands characterised by its elevation leading to reduced minimum and maximum temperatures compared to the coastal lowlands with an average of 80 rain days per annum. Inland zone – covering most project sites the inland zone is characterised by less humidity and reduced rainfall with higher temperatures, often exceeding 40 degrees. Whilst experiencing half the average rainfall of the coastal lowlands, year to year differences commonly vary from less than 250mm to greater than 500mm. Large summer storms on soaked catchment areas can lead to significant seasonal flooding.
Indigenous Cultural Heritage	The Traditional Owner/s of the land the project works will be undertaken on are: • Birriah People • Jangga People #2 • Yirendali People Core Country Claim • Wanamara People Core Country Claim • Mitakoodi People #3 • Mitakoodi People #5 • Kalkadoon People #4 • Yulluna People • Gudjal People
Non-Indigenous Cultural Heritage	23 Queensland (non-Indigenous) heritage listed items by state or local governments within 5km of the project area.
Surrounding Land Use	Agricultural – cattle grazing and feeding.
Contaminated Land	Contaminated land sites listed on the EMR (1 substation and 15 mainline locations) – various categories 2 sites registered on the Unexploded Ordnance database (possibly used for live fire training activities)
Proximity to Sensitive Areas	The project alignment traverses through or comes within proximity to the following sensitive areas: • Regulated vegetation • Mapped essential habitat areas and suitable habitat for threatened species • Known species locations • Culturally significant places • Wetland protection areas (buffer only) • Protected plants (buffer only) • Riparian zones (with mapped waterways and watercourses and drainage features) • Sensitive receptors, including residential receptors
Key Environmental Factors (Aspects)	The key environmental aspects during construction to be addressed by this CEMP/aligned with proposed aspect specific Sub Plans, include: • Biodiversity – MSES, Flora and Fauna • Threatened Species (MNES) • Amenity (air, noise and vibration) • Biosecurity • Hazardous materials

Project Component	Description
	• Erosion and sediment control • Waste • Heritage (Aboriginal and Non-Indigenous) • Rehabilitation • Water Quality (surface water, groundwater). Multiple aspects are also applicable to discrete activities and therefore will be managed by individual plans including: • Water sources • Borrow Pits (commercial sources identified to date but borrow pits may be identified) • Concrete Batching • Sewage Treatment.

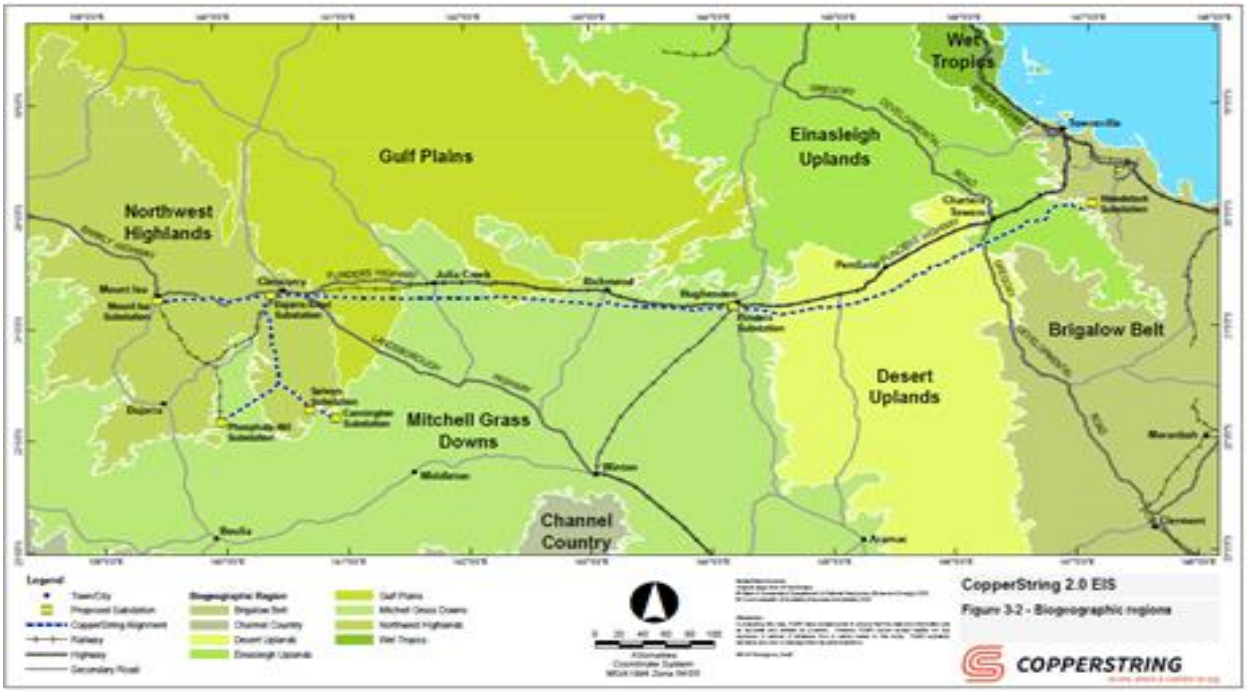

Figure 2 Overview of the projects bioregions

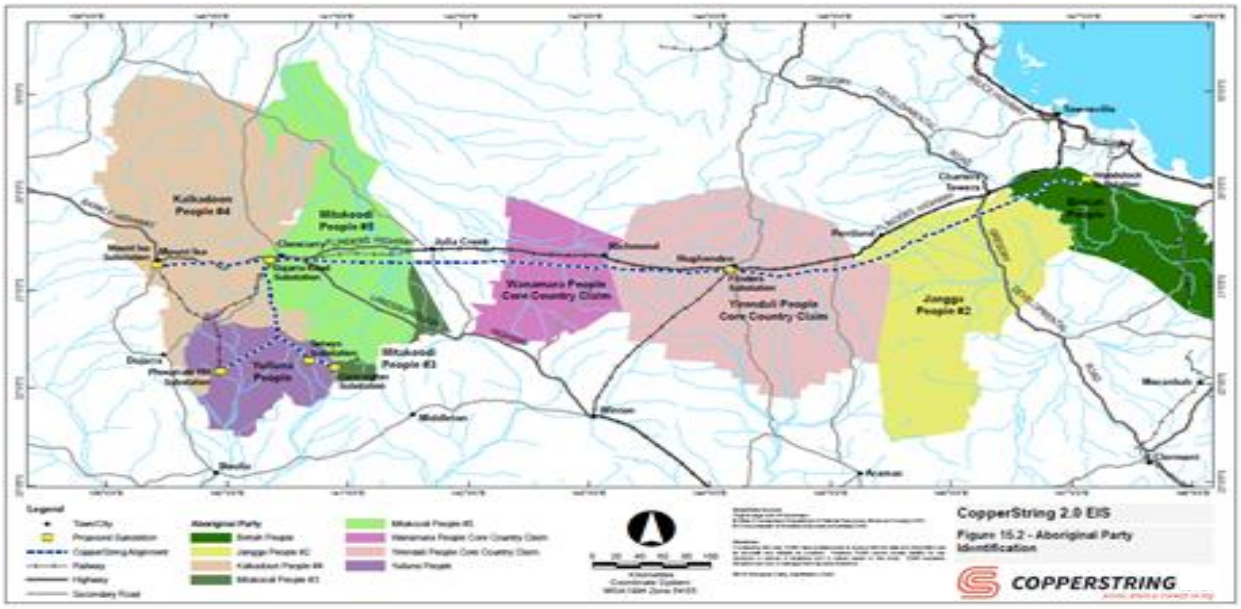

Figure 3 Traditional Owners across the projects footprint and surrounding areas

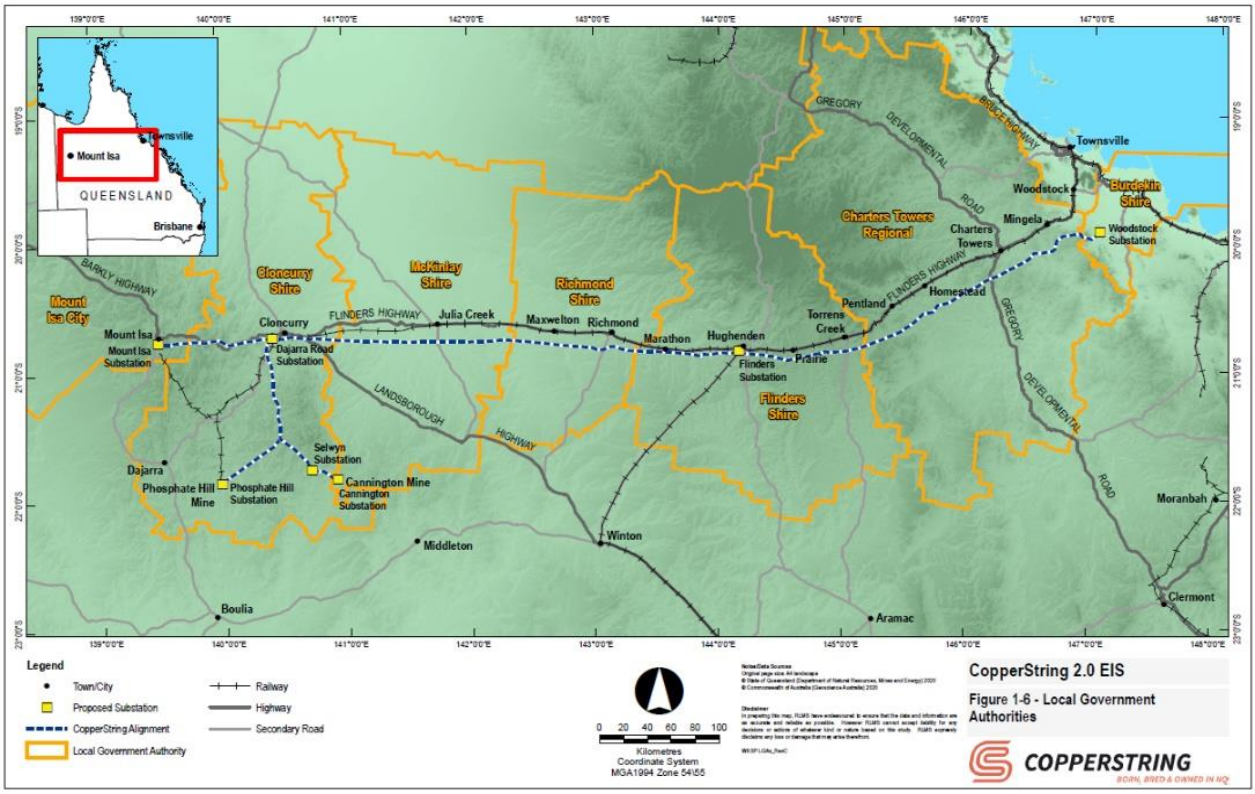

Figure 4 Local Government Area's across the project

1.4 Purpose

This CEMP defines the management of environmental compliance on all activities undertaken by the UGL and CPB Joint Venture (The JV) associated with the development of the CopperString 2032 project.

The CEMP will be submitted to the Regulator administering the project prior to the commencement of works.

The JV has an obligation to manage the environmental compliance requirements associated with the performance of all works. The JV does this using their Environmental Management System (EMS) which is based on the UGL Management System (UGLMS). UGL's EMS has been externally certified and maintained in compliance with AS/NZS/ISO 14001:2015 with the current certificate in place until 2026 subject to annual compliance checks.

This CEMP provides a high-level structure on how the CopperString 2032 project will manage its environmental obligations and responsibilities across all work activities. It is structured so that it can be used as a system implementation tool to ensure compliance with the UGL/CPB EMS. This plan:

1. Explains the content, structure and relationship with other systems used by the project
2. Establishes how the project will maintain environmental compliance with legislation, standards, guidelines and approvals establishing best practice in environmental management
3. Outlines the project risk profile, core function and work activities
4. Sets performance objectives and targets
5. Identifies, based on environmental aspects, feasible mitigation measures to avoid, prevent and/or minimise potential impacts and harm to communities and the environment.

The purpose of this is to meet the needs of the CopperString 2032 project and Powerlink Queensland, to ensure legal compliance, provide for continuous improvement and minimise adverse impacts on the environment.

The effective implementation of this CEMP is the responsibility of all project personnel and subcontractors; however, the JV Project Director has ultimate accountability for ensuring that compliance occurs.

This CEMP has been prepared to align with the:

- EIS "Framework and environmental management plan" (Draft EIS, Volume 3 Appendix Q) environmental management strategy
- AS/NZS ISO 14001:2016 Environmental management systems – requirements with guidance for use.

This CEMP has been prepared specifically to address the requirements of:

- UGL Procedures and developed project references, refer to Section 3.1
- Project specifications and standards, refer to Section 3.2
- Project approvals and specific project documentation (to be developed as design progresses), refer to section 3.3.

This document references procedures, guidance materials, templates and tools for implementation. These documents will be obtained from UGL's EMS as the current and correct version. This CEMP does not address client obligations including biodiversity offsets as per the Project Approvals and Compliance Matrix (latest version thereof).

1.5 Principles & objectives

The JV commits to the values of Integrity, Accountability, Innovation and Delivery as the strategy for the execution of the works and commits further that the Project will be completed in such a way that our people and the environments that we work within are managed wherever possible to avoid adverse impacts.

All environmental management activities will align with the JV Principles and PQ Objectives as detailed in the Project Execution Plan (9310-JV-PLN-PEP-0001). The primary items related to this plan are:

- Protect and enhance the environment
- Implement industry leading program management systems
- All activities will always be conducted in an ethical and responsible manner and achieve as a minimum, compliance with project approvals.

1.6 Definitions and acronyms

A complete list of all acronyms and abbreviations used within this Plan is provided in Table 3 below.

Table 3 Definitions and acronyms

Acronym	Definition
AS	Australian Standard
BMP	Biosecurity Management Plan
CEMP	Construction Environmental Management Plan
CESCP	Certified Erosion and Sediment Control Plan
CHMP	Cultural Heritage Management Plan
CM	Construction Manager
CoG	Coordinator General's Evaluation Report (September 2022)
CPB	CPB Contractors
DAF	Department of Agriculture and Fisheries
DCCEW	Department of Climate Change, the Environment and Water
DES	Department of Environment and Science
DNR	Department of Resources
EA	Environment Advisor
ECA	Environmental Constraints Assessment

Acronym	Definition
EIS	Environmental Impact Statement (includes draft and supplementary available online)
EM	Environmental Manager
EMF	Environmental Management Framework
EMS	Environmental Management System
ERP	Emergency Response Plan
ESA	Environmentally Sensitive Areas
ESC	Erosion and Sediment Control
EWMS	Environmental Work Method Statement
FSC	Fauna Spotter Catcher
GIS	Geographical Information System
HSE	Health, Safety and Environment
ICAM	Incident Cause Analysis Method
IECA	International Erosion Control of Australia
JV	Joint Venture
KPIs	Key Performance Indicators
MID	Ministerial Infrastructure Designation
NCR	Non-Conformance Report
NEM	National Electricity Market
NEPM	National Environmental Protection Measures
NGER	National Greenhouse and Energy Reporting
NWMP	North West Minerals Province
P-CESCP	Progressive Certified Erosion and Sediment Control Plan
PD	Project Director
PMS	Project Management System
PQ	Powerlink Queensland Pty Ltd (Client)
RAP	Regulatory Approvals Plan
RMMP	Rehabilitation Management and Monitoring Plan
QMP	Quality Management Plan
SDS	Safety Data Sheet
SS	Site Supervisor
SuperGrid	Super Grid (wide area transmission network)
SWMS	Safe Work Method Statement
SYNERGY	The JV Online Incident and Event Reporting
TMP	Traffic Management Plan
UGL	UGL Engineering Pty Ltd
UGLCPB JV	UGL Engineering Pty Ltd and CPB Contractors
UGLMS	UGL Management System
UXO	Unexploded Ordinance
WMP	Waste Management Plan
WQMP	Water Quality Management Plan

1.7 EIS Compliance

The following table details the location of the EIS compliance information relevant to this management plan.

Table 4 EIS Compliance reference

No.	EIS Reference	Compliance in Management Plans
1	Volume 2 – Chapter 1 – Introduction	N/A
2	Volume 2 – Chapter 2 – Project Description	N/A
3	Volume 2 – Chapter 3 – Site Description and Climate	Across all documents and within EPC Schedule and Basis of Schedule.
4	Volume 2 – Chapter 4 – Legislation and Approvals	CEMP Appendix A - D
5	Volume 2 – Chapter 5 – Land	CEMP Section 18.1 and 18.11
6	Volume 2 – Chapter 6 – Geology and Soils	CEMP Section 18.1
7	Volume 2 – Chapter 7 – Flora and Fauna	CEMP Section 18.4 and 18.5
8	Volume 2 – Chapter 8 – Biosecurity	CEMP Section 18.3
9	Volume 2 – Chapter 9 – Water Resources and Water Quality	CEMP Section 18.2
10	Volume 2 – Chapter 10 – Air and Greenhouse Gas	CEMP Section 18.7
11	Volume 2 – Chapter 11 – Noise and Vibration	CEMP Section 18.6
12	Volume 2 – Chapter 12 – Waste Management	CEMP Section 18.10 and Waste Management Plan (separate)
13	Volume 2 – Chapter 13 – Transport	Traffic Management Plan (separate)
14	Volume 2 – Chapter 14 – Social	CuS – Social Impact Management Plan (separate)
15	Volume 2 – Chapter 15 – Cultural Heritage	CEMP Section 18.8 CuS – Cultural Heritage Management Plans (separate)
16	Volume 2 – Chapter 16 - Economic	N/A
17	Volume 2 – Chapter 17 – Hazards Health and Safety	Workplace Health and Safety Management Plan (separate)
18	Volume 2 – Chapter 18 – Matters of National Environmental Significance	CEMP Section 18.4.6
19	Volume 2 – Chapter 19 – Environmental Management	CEMP Section 18
20	Volume 2 – Chapter 20 – Cumulative Impacts	N/A, EIS commitments identified herein
21	Volume 2 – Chapter 21 – Environmental Offsets	Client Obligation
22	Volume 2 – Chapter 22 – Conclusions and Recommendations	N/A
23	Volume 2 – Chapter 23 - References	N/A

2. The Way We Operate

'The Way We Operate' is an overall process that guides how the JV manages our business to meet client and other stakeholder requirements. It fosters an integrated approach across all operations and functions to deliver outcomes that ensure third party certifications in relation to Australian and International Standards for Safety, Health, Environment and Quality are maintained.

2.1 The JV's Management System

UGL is the Principal Contractor for carrying out all construction works forming part of the works under the contract and the UGL Management System will apply to all JV workers, subcontractors and consultants. UGL is authorised to have management or control of those workplaces necessary to discharge its duties as Principal Contractor.

The JV's Management System is based on UGLMS and helps achieve safe and efficient delivery of our requirements under the Contract, as well as our overall business objectives.

The UGLMS integrates a number of elements which operationalise 'The Way We Operate' processes to achieve a fully integrated, systematic, planned and consistent approach to delivering work. These elements are detailed in the table below.

Table 5 Document type definitions

Element	Description
Policy	A statement of strategic intent, commitment and includes minimum requirements

Element	Description
Procedure	Describes the steps to be undertaken to complete an activity, the accountable roles and the tools and knowledge to be used
Work Instruction & Safe Work Procedures	Provides detailed instructions on how to conduct a step within a Procedure
Tools	Preformatted documents (forms and templates) used to collect specific data or information for a particular purpose
Knowledge	Reference material to provide context or guidance to a Policy or Procedure
Business Applications	Software tools used to manage our business and operations

Underpinning the management system is a range of Business Applications (software) used to manage and support our operations.

2.2 Project Management System (PMS)

The JV's UGLMS documentation (which includes Corporate and Business Unit requirements) forms the foundation of the Project Management System (PMS) as the Principal Contractor. The PMS is a combination of the UGLMS / CPBMS and project-specific content, as required by approvals.

One of the key features of the management system is the integration of documentation. Rather than having separate, auditable systems (particularly for ISO Standard certification) the system works as a whole to ensure work is done safely, efficiently and in compliance with requirements.

In particular, health, safety, environment and quality (HSEQ) requirements are embedded within, for example, the construction planning and execution process. Relevant procedures in these areas are integrated with linkages to ensure work is executed seamlessly and without duplication, making the system easy to use and enabling work to be done efficiently.

2.3 Project staging

The project is proposed to be implemented in stages as follows to facilitate best for project outcomes:

- Early Works Agreement
- Project Delivery Launch Agreement
- Main Works Agreement.

2.3.1 Early works planning

As part of early works, the JV will undertake key environmental planning aspects to support the project's regulatory approval requirements, and further design including:

- Field investigations (noting PQ are undertaking alignment ecology (pre-clearance) surveys):
  - Geotechnical investigations prior to construction to determine the appropriate foundation type for each structure and the substations
  - Waterway assessments
  - Crossing (road/rail/other easements) assessments
  - Road traffic studies and condition assessments
  - Unexploded ordnance investigations
  - Contaminated land
  - Property/ad hoc environmental related inspections.
- Flood studies (to inform permanent electrical works and camp settings)
- Traffic Impact Assessments, Road Use Management Plans and preliminary road designs
- Camp planning and concept design and associated environmental studies to inform siting considerations including bushfire, noise and air, and stormwater management

- Waste assessment and update of the existing Plan.

An Early Works CEMP has been prepared (9310-JV-PLN-CEM-0003) for field investigations required. Note: Early works are being interpreted by the PQ as exempt from being considered the "controlled action". Additional investigations have been scoped in early works to inform constructability with an environmental interface. These include:

- Construction commodities (water and gravel) sourcing
- Aerial LiDAR survey and photography augmenting the currently available data
- Operational noise (substation) study
- Ongoing engineering and design.

2.3.2 Project Delivery Launch Agreement

To enable the project to progress beyond early works and facilitate the main works schedule, environmental planning has been proposed in line with the requirements of this CEMP as part of a collaborative Project Delivery Launch Agreement (PDLA).

The PDLA environmental planning scope will include but is not limited to:

- Preparing and obtaining secondary approvals (refer to Section 3.3)
- Preparing the project' Environmental Management Framework (refer to Section 3.4)
- Environmental scouting and constraints assessments to verify Environment in Design (refer to Section 7)
- Management controls required to facilitate site access including but not limited to:
  - Biosecurity treatments
  - Road traffic/detailed camp noise modelling
  - Studies as per conditions of approvals obtained during this scope
  - Development of a Site Access Management Plan (refer to Section 15).

3. References

3.1 UGL procedures and references

The following table is a list of UGL Procedures and Project specific documents that are referenced throughout this CEMP.

Table 6 UGL and project specific documentation

Aspect	Document Number	Document Title
UGL procedures and documents		
Air	UGLMS-131-546	Air Quality Management
Noise and Vibration	UGLMS-131-401	Noise & Vibration Management
Land	UGLMS-131-390	Erosion and Sediment Control
Biodiversity	UGLMS-131-548	Flora and Fauna Management
Internal Permit	UGLMS-4-2184	Permit to Disturb Land or Clear Vegetation
Biodiversity	UGLMS-4-2034	Pre-Clearing Inspection Checklist
Biodiversity	UGLMS-4-2035	Post-Clearing Inspection Checklist
Heritage	UGLMS-131-389	Heritage Management
Heritage	UGLMS-131-2040	Cultural Heritage New Find (tool)
Biosecurity	UGLMS-131-544	Pest Management
Hazard	UGLMS-131-377	Hazardous Chemicals Management (procedure)
Hazardous Materials	UGLMS-131-547	Spill Response and Remediation
Hazardous Materials	UGLMS-4-1556	Spill Kit Inspection Checklist
Waste	UGLMS-131-387	Waste Management
Biosecurity	UGLMS-131-391	Weed Management
Biosecurity	UGLMS-4-1321	Herbicide and Pesticide Checklist

Aspect	Document Number	Document Title
Biosecurity	0643-JV-FRM-ENV-001	Biosecurity Hygiene Form
Internal Permit	UGLMS-4-1324	Dewatering (approval to discharge) Permit
Internal Permit	UGLMS-4-2036	Permit to Enter a Protected or No Go Areas
Assurance	UGLMS-131-349	HSE Inspections (procedure)
Inspections	UGLMS-4-1549	Environmental Inspection Weekly Checklist
Reporting	UGLMS-4-1765	Environmental Monthly Report
Incident Management	UGLMS-131-331	Incident Management – Reporting and Investigation (procedure)
Assurance	UGLMS-131-354	Check It HSE Activity Planner (procedure)
Assurance	UGLMS-4-993	Check-it Planner (template)
Risk	UGLMS-131-342	Environmental Aspects and Impacts (procedure)
Contractor	UGLMS-131-807	Contractor HSEQ Requirements (handbook)
Sustainability	UGLMS-4-1470	Subcontractor Sustainability Data Reporting (form)
Legal	UGLMS-131-550	Legal and Compliance management (procedure)
Legal	UGLMS-4-1972	Legal (environmental) Register
Planning	UGLMS-131-813	HSEQ Planning (procedure)
Document Control	UGLMS-4-1309	HSE Records Register (tool)
Project specific documents		
Management Plan	9310-JV-PLN-BMP-0012	Bushfire Management Plan
Management Plan	9310-JV-PLN-SMP-0023	Sustainability Management Plan
Management Plan	9310-JV-PLN-SWP-0011	Severe Weather Management Plan
Management Plan	9310-JV-PLN-WRD-0017	Waste & Refuse Disposal Management Plan
Management Plan	9310-JV-PLN-QMP-0007	Quality Management Plan
Management Plan	9310-JV-PLN-CWM-0050	Traffic Management Plan
Management Plan	9310-JV-PLN-PLM-0020	Procurement Management Plan
Management Plan	9310-JV-PLN-HSE-0002	H&S Implementation Management Plan
Management Plan	9310-JV-PLN-CLM-0004	Community Liaison Management Plan
Management Plan	9310-JV-PLN-DMP-0013	Design Management Plan
Tool	0643-JV-REG-CUS-005	Environmental Permit Register (Early Works)
Tool	0643-JV-REG-CUS-006	Weed Hygiene and Materials Register (Early Works) (Use of QR Code and online system is proposed for washdown records)
Client documents		
Client document	3466-0067-0755-v1	Land Access Protocol
Client document		Land Access Form V9

The above procedures will be updated with current versions made available on the EMS. This will mean that at times there could be a lag between the above document references and those documents which are in the EMS. As first point of reference, always refer to the procedures which are located on the EMS. Periodic updates to this CEMP will be undertaken and when this occurs, the above table will be updated.

3.2 Specifications and standards

This Project will comply with the following Specifications and key Standards.

Table 7 Specifications and standards

Document Number	Document Title
CoG Report	CopperString Project Coordinator-General's evaluation report on the environmental impact statement (September 2022)
Supplementary EIS	CopperString 2032 Supplementary Environmental Impact Statement
Draft EIS	CopperString 2032 Environmental Impact Statement
CSPW-HSW-SPE-M8-000001	CopperString2032, Powerlink – HSE Specification for Contractors and Suppliers, version B (HSE Specification)
ENG-20210413-PLN-CopperString2032 HSEMP	CopperString 2032 HSEMP
IECA 2008	International Erosion and sediment Control Association (IECA) – Australia

Document Number	Document Title
	"Best Practice Erosion and Sediment Control" document
DNRME, 2015	Soil Conservation Guidelines for Queensland 2015, 3rd edition
NEPM	National Pollutant Inventory Assessment of site contamination Movement of controlled waste Diesel vehicle emissions Ambient air quality
ANZECC 2000	ANZECC & ARMCAN (2000) water quality guidelines
AS 2436 (2010)	Guide to Noise Control on Construction, Maintenance and Demolition Sites
AS 4970 (2009)	Protection of Trees on Development Sites (i.e. applicable to camp/substations sites not mapped as regulated vegetation)
AS1055.2 (1997)	Acoustics – 'Description and measurements of environmental noise – Part 2: Application to specific situations
AS 2363 (1999)	Acoustics – Measurement of noise from helicopter operation
AS 1940 (2017)	Storage and Handling of Flammable and Combustible Liquids
AS 3780 (2008)	Storage and Handling of Corrosive Substance
DES Publication	Guideline: The duty to notify of environmental harm (18 July 2022)
DES Publication	Guideline: Duty to notify for contaminated land (Version 1)
DES Publication	Procedural Guide: Releases to waters from land development sites and construction sites 2500m2 and greater
DES Publication	Codes of Environmental Compliance: Extraction and screening Concrete batching Regulated waste transport Sewage treatment works
DES Publication	Code of Practice: Care of Sock, Injured or Orphaned Protected Animals in Queensland
DES Publication	Concrete batching industry code of practice (expired but still referenced)
DNRME Publication	Riverine protection permit exemption requirements
DAF Publication	Accepted development requirements for operational work that is constructing or raising waterway barrier works
Energy Networks Australia	ENA Guidelines for Safe Vegetation Management (ENA DOC 023-2009)
Energy Networks Australia	Vegetation Risk Management for Overhead Electrical Networks – Guideline (ENA DOC 038-2018)
AS ISO 14004:2018	Environmental Management Systems – General guidelines on implementation
AS ISO 31000:2018	Risk management – Guidelines
AS ISO 31000:2018	Risk management – Guidelines
DES, 2018	Monitoring and Sampling Manual 2018, Version 2
NHMRC, 2018	Australian Drinking Water Guidelines, Version 3.5, 2018

3.3 *Environment Protection and Biodiversity Conservation Act 1999* Approval

This CEMP and associated Sub Plans have been prepared in accordance with the requirements of the approval was granted from the Department of Climate Change, Energy, the Environment and Water (DCCEEW) (Commonwealth) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC 2019/8416).

3.4 Coordinator General's report

This CEMP addresses the CoG Evaluation Report:

- Appendix 1 (imposed conditions)
- Appendix 2 (recommendations)
- Appendix 3 (recommended conditions for the Commonwealth Minister for Environment)
- Appendix 4 (Proponent commitments) requirements
- Appendix 5 (micro-siting) requirements as detailed in the Environment In Design Section 7 of this CEMP.

Refer to **Appendix A – CoG Report Cross Reference** of this CEMP where this document addresses the CoG Evaluation Report.

Notedly this CEMP addresses recommended Condition 33 of Appendix 2, Part B of the CoG Report as cross referenced in the table below. Additional conditions of the CoG Report have also been addressed herein (refer to the separate project's Approvals and Compliance Matrix).

Table 8 CoG Report recommended Condition 33 cross reference

Condition	Document Name	CEMP Cross Reference
33(a)	Prior to the commencement of works, prepare and submit a Construction Environmental Management Plan (CEMP) to DSDILGP (infrastructuredesignation@dsdlgip.qld.gov.au). The CEMP must be consistent with management measures detailed in the Project EIS and must include/address the following:	This document (updated based on tender award, design, approvals, additional studies and stakeholder consultation)

33a(i)	An Erosion and Sediment Control Plan (ESCP) developed in accordance with Best Practice Erosion and Sediment Controls Document prepared by the International Erosion Control Association and dated November 2008, and Queensland's Construction Phase – Stormwater Management Design Objectives, prepared by the then Department of Infrastructure, Local Government and Planning and dated July 2017, that addresses/includes:
	• A suitably detailed description of the existing environment
	• A suitably detailed description of proposed clearing and the post clearing land use
	• An erosion hazard and risk assessment with both:
	  ○ The vegetation clearing operations
	  ○ The post clearing activities on the development site
	• A detailed description of the proposed erosion and sediment control measures applicable during:
	  ○ The vegetation clearing operations
	  ○ The subsequent land use
		Refer to CEMP Sub Plans proposed
		
		Refer to CEMP – Soil Management Section 18.1

Condition	Document Name	CEMP Cross Reference
	• Details of the proposed performance monitoring program and an ESCP review process.	
33a(ii)	A Water Quality Management Plan which is to include mitigation works and actions, including measures identified in the EIS for the project, to address potential impacts of the project on the aquatic environment.	Refer to CEMP Sub Plans proposed Refer to CEMP – Surface & Ground Water Management Section 18.2
33a(iii)	Flora and Vegetation and Fauna Management Plans.	Refer to CEMP Sub Plans proposed Refer to CEMP – Flora & Vegetation Management Section 18.4 Refer to CEMP – Fauna Management Section 18.5
33a(iv)	A Rehabilitation Plan for temporary construction sites and cleared areas that includes: • Rehabilitation measures for disturbed areas as soon as practicable to limit exposure to erosive processes • Remediation measures for any areas of contaminated land • Commitments, mitigation, and management measures consistent with those identified in the project EIS.	Refer to CEMP Sub Plans proposed Refer to CEMP – Soil Management Section 18.1
33a(v)	A dewatering management plan that establishes suitable protocols to treat or remove water from the site, should it be required during construction.	Refer to CEMP – Surface & Ground Water Management Section 18.2
33a(vi)	Dust mitigation measures (such as the use of water to suppress potential dust) and air quality management measures, within an Air Quality (Dust) Management Plan.	Refer to CEMP Sub Plans proposed Refer to CEMP – Air Quality Management Section 18.7
33a(vii)	Hours of construction, vibration and construction noise (including the default noise standards), in accordance with the EPA Act (S440R and 440S)	Refer to CEMP – Noise & Vibration Management Section 18.6
33a(viii)	A waste management pan detailing • Preference of waste management in the following order – avoid or reduce, reuse, recycling, recover, treat and disposal • How each waste stream is to be stored, transported and disposed of • Estimated quantities of waste from each waste stream • Details of waste transport companies to be utilised and copes of any relevant licences • Reporting on consultation with relevant councils regarding disposal at existing council facilities • Details of waste disposal facilities to be utilised and copies of any relevant licences and waste acceptance criteria.	Refer to CEMP Sub Plans proposed Refer to CEMP – Waste Management Section 18.10
33a(ix)	A Biosecurity Management Plan	Refer to CEMP Sub Plans proposed Refer to CEMP – Biosecurity Management Section 18.3
33a(x)	Measures to manage any contaminated land	Refer to CEMP Procedures proposed Refer to CEMP overarching unexpected finds procedure in Section 18.11
33a(xi)	Cultural heritage management plans	CHMPs approved (Client provided) Refer to CEMP Cultural & European Heritage Management Section 18.8
33a(xii)	A Hazard, Health and Safety Management Plan detailing disposal and management of hazardous materials and	Refer to CEMP – Hazardous Materials Management Section 18.9

Condition	Document Name	CEMP Cross Reference
	regulated waste, including removal by a suitably licenced contractor where deemed necessary.	Refer to CEMP – Waste Management Section 18.10
33a(xiii)	Traffic access locations or and management of construction vehicle traffic	Refer to the Construction Traffic Plan as per CoG Report, Appendix 2, Part B, Condition #7
33a(xiv)	Maintenance of safe pedestrian and cycling access/movement around the site (if relevant)	As above
33a(xv)	Proximity of works to easements and service and any necessary design measures, additional analysis or safe work methods	As above
33a(xvi)	Other required permits from Council, easement holders or utility providers	Refer to the Project's Approval Plan, CEMP Section 3.3
33a(xvii)	Complaint resolution procedures, including who to contact and a record of how complaints have been addressed	Refer to the Community Liaison Management Plan CEMP Section 11 for environmental based complaints response
33a(xviii)	A construction communication plan including: • How neighbouring properties will be advised of construction activities for each stage • How the appropriate extent of neighbouring properties to be notified will be determined • Timeframes for notification of construction activities to occur prior to works commencing.	Refer to the Community Liaison Management Plan for details. CEMP Section 11 will be updated with any changes required by this Plan
33b	Construction of the development is to be undertaken in accordance with the CEMP.	Implementation of this Plan. Refer to: • Environment in design • Implementation work practices • Compliance approach • Operational controls.

3.4.1 Regulatory approvals

This CEMP identifies regulatory approvals which are required to construct CopperString 2032. The JV will:

- Identify regulatory approvals required during detailed design
- Develop a secondary approval strategy to support the project program and achieve best reasonable outcomes in negotiation of approval conditions
- Implement a coordinated approach to obtaining approvals on a timely basis.

Refer to **Appendix D** of this CEMP for high level summary of approvals identified to date, prepared as a draft Regulatory Approvals Plan (RegAP). This RegAP identifies:

- Ministerial Infrastructure Designation (MID) staging and coordination of JV technical information for submission to PQ to submit and obtain approval for works to commence:
  - Including:
    - Camps, temporary facilities, laydowns
    - Road Crossings and Infrastructure upgrades
    - Rail Crossings
    - Brake and winch sites off easement
    - Access tracks off easement
    - High Voltage crossings
    - Mobile batch plant locations

- Commonwealth and State environmental approvals (primary and secondary) including but not limited to:
  - Matters of National Environmental Significance (MNES)
  - Waterway crossings not code compliant
  - Riverine riparian works where not exempt
  - Fauna species management
  - Protected plants (if found)
  - Water sources
  - Borrow Pits (where existing licenced quarries are not reasonably located)
  - Road permits for upgrades / crossings
  - Infrastructure crossing permits for crossing of electrical/gas/water infrastructure from third party entities.

The RegAP will be continually updated as live document. The RegAP will have regard to the EIS Volume 3 Appendix L “Regulatory Approval Plan”.

The JV will approach identifying and obtaining regulatory approvals as follows.

- Implement a weekly approval’s meeting with relevant internal and Client Stakeholders to track progress/issues with approvals
- Complete JV technical information for submission of the MID approval process to the Client to submit.
- Engagement of specialists to support the JV technical scope
- Imbed environmental review processes during design (Refer to Section 7)
- Consult with third party(ies) as required, subject to the requirements of the project’s Community Liaison Management Plan including:
  - Local Government Authorities (LGAs)
  - Landholders
  - Department of Regional Development
  - Road, Rail, Water and Gas entities
  - Mining tenure holders
- Assess approval requirements as part of management of change
- Request pre-lodgement meetings with environmental regulators including but not limited to:
  - Department of Agriculture and Forestry (DAF)
  - Department of Environment and Science (DES)
  - Department of Resources
  - Department of Regional Development, Manufacturing and Water (DRDMW)
  - Department of Climate Change, Energy, the Environment and Water (DCCEW)
- Prepare application documentation aligned (generally in accordance with) with the CoG Report (including the Supplementary EIS and Draft EIS recommendations, commitments, other), Stakeholder consultation and pre-lodgement meetings
- Peer review of draft documentation by the Construction team pre submission.

The RAP will include maintaining a Regulatory Approvals Register on a Lot Plan/section/MID basis that tracks:

- Applications planned, under preparation and submitted for statutory decision
- Pre-lodgement requests
- Issued approvals including:
  - Effective date
  - Expiry date (if applicable)
  - Links to copies of approvals (condition compliance spreadsheet).

Compliance verification with conditions of approvals will be undertaken in accordance with the environmental compliance approach in this CEMP which includes a comprehensive assurance program and compliance tracking spreadsheet of approval conditions.

3.5 JV Environmental management framework

This CEMP proposes the following environmental management framework (EMF) governing site activities.

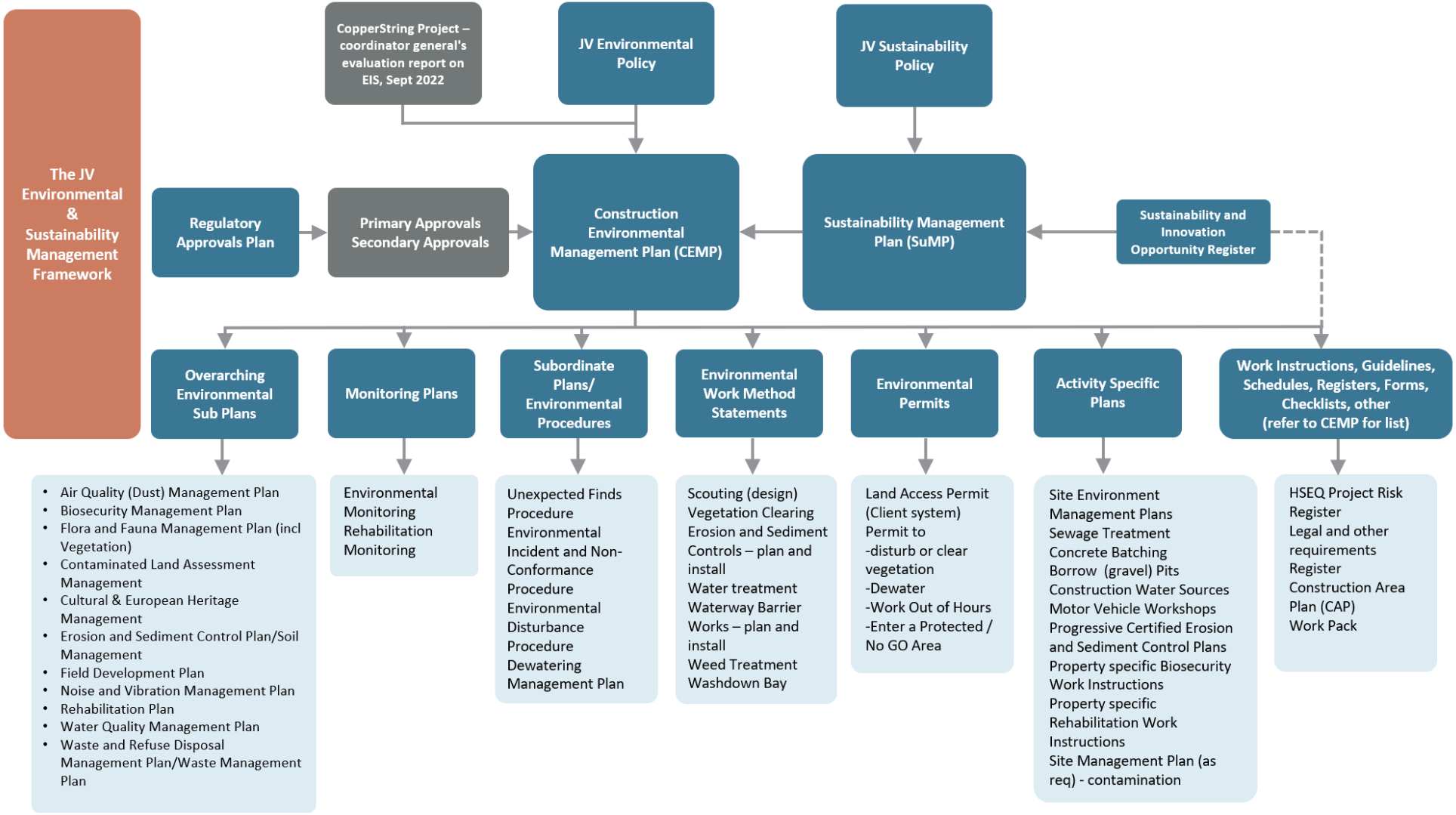

Figure 5 The JV Environmental Management Framework

3.5.1 CEMP Sub Plans

This CEMP is to be read in conjunction with the following proposed aspect specific Sub Plans and project procedures to be developed for the management of significant risks associated with construction of the CopperString 2032 project.

Note, all existing plans relating to other disciplines (eg. accommodation and logistics) will have an environmental interface and / or will be critical to implementation and compliance, and a review of these will be undertaken prior to construction to ensure alignment with provisions herein.

Table 9 Environmental technical and activity specific plans and procedures

Aspect	Document Name	CEMP Cross Reference
Approvals	Regulatory Approvals Plan	Update on development
Air	CEMP Sub Plan – Air Quality Management Plan	Update on development
Noise and Vibration	CEMP Sub Plan – Noise and Vibration Management Plan	Update on development
Water	CEMP Sub Plan – Water Quality Management Plan	Update on development
Biodiversity	CEMP Sub Plan – Flora and Fauna Management Plan (encompasses species specific management plan and the Vegetation Management Plan)	Update on development
Cultural heritage	CEMP Sub Plan - Cultural and European Heritage Management Plan	Update on development
Biodiversity	CEMP Sub Plan – MNES Threatened Species Management Plan	Client Obligation to develop
Land	CEMP Sub Plan – Erosion and Sediment Control Management Plan • Progressive CESCPs CEMP Sub-Plan – Contaminated Land Assessment Management Plan	Update on development
Biosecurity	CEMP Sub Plan – Biosecurity Management Plan	Update on development
Waste	CEMP Sub Plan – Waste Management Plan	Update on development
Rehabilitation	CEMP Sub Plan – Rehabilitation Management and Monitoring Plan	Update on development
Greenhouse Gases	CEMP Sub Plan – Greenhouse Gas Offset Plan	Update on development
Unexpected Finds	CEMP Procedure – Unexpected Finds Procedures (contaminated land/UXO and Non-Indigenous Heritage)	Update on development
Incident Management	CEMP Procedure – Environmental Incident and Non-Conformance Procedure	Update on development
Disturbance Management	CEMP Procedure – Environmental Disturbance Procedure	Update on development
Monitoring	CEMP Monitoring Plan – Environmental (summary document identifying all monitoring requirements of the EMF)	Update on development
Monitoring	CEMP Monitoring Plan – Rehabilitation Management and Monitoring Plan	Update on development
General	CEMP – Activity Specific Plan - Sewage Treatment Management Plan (accommodation facilities)	Update on development
General	CEMP – Activity Specific Plan - Concrete Batching Plant Management Plan	Update on development
Land	CEMP – Activity Specific Plan - Borrow Pit Management Plan	Update on development if required
Water	CEMP – Activity Specific Plan - Water Source Management Plan	Update on development
Water	CEMP – Activity Specific Plan – Motor Vehicle Workshop Plan	Update on development

3.5.2 Supporting documentation

This CEMP proposes the development of project specific supporting documentation including but not limited to the following.

Table 10 CEMP supporting documentation proposed

Aspect	Document Name	CEMP Cross Reference
Approvals	Regulatory Approvals Register	Drafted (Appendix D)- Live
Design	Environmental Constraints Checklist	Update on development
Disturbance	Disturbance Drawdown Register	Drafted - Live
Site Access Management	Biosecurity Work Instructions Rehabilitation Work Instructions Progressive	Update on development
Monitoring	Environmental Monitoring Schedule	Update on development
Monitoring	Environmental Data Register	Update on development
Assurance	Environmental Assurance Program	Update on development
Assurance	Environmental Aspect Specific Inspection Forms	Update on development
Assurance	Compliance Register (i.e. Approvals and Compliance Matrix)	Drafted - Live
Awareness	Environmental Toolbox Schedule	Update on development
Reporting	Environmental Reporting Schedule	Update on development
Workpack	CEMP Translation Spreadsheet Site Environmental Plans Environmental Specific Workpacks	Update on development (note a separate register will be maintained for workpack development)

3.5.3 Related documentation (interfaces)

This CEMP must be read in conjunction with the following proposed documentation.

Table 11 CEMP related documentation

Aspect	Document Name	Relatedness
Roadwork use and works	Road Use Management Plan	For public road management
Traffic	Construction Traffic Management Plan	For biosecurity, flora and fauna impacts
Emergencies	Flood emergency and evacuation procedure (in accordance with the severe weather management plan)	Environmental emergencies
Flood	Flood Modelling and Management Plan	Tower Pad micro-siting
Stormwater	Stormwater Drainage Management Plan	Camp design and management
Communication	Community Liaison Management Plan	For environmental related communication
Construction	Construction Management Plan (for railway environs)	For implementation strategies alignment

4. Organisational Commitment & Leadership

4.1 Environmental policy statement

The requirements and intent of this CEMP align with the statements made in the UGL Environmental Policy (which will be adhered to by the JV) and CopperString 2032 HSEMP. The JV Policy (UGLMS-7-328) is a commitment by Senior Management to the EMS. To achieve this, the policy will be:

- Displayed at prominent locations within the Project office
- Referenced within the HS&E inductions to personnel
- Included as **Appendix B** within this CEMP.

4.2 Environmental strategy

The Project will develop and implement an Environmental Strategy which documents the objectives and priorities to achieve the environmental requirements outlined within this CEMP.

Leadership objectives and targets will closely align with the Key Performance Indicators (KPIs) of this CEMP.

The strategy must align with the JV Corporate and Divisional environmental strategies and Policy.

4.3 Environmental planning across the project lifecycle

The Project will undertake planning in accordance with HSEQ planning procedures. At a minimum this will include:

- Environmental approvals. Obtain and imbed legal requirements in its project delivery process, and ensure all activities are undertaken in accordance with the relevant approval documentation, where this is the responsibility of the JV
- Risk management. Ensure that risk management processes are integrated throughout the lifecycle of the project. Environmental aspects and impacts (including legal, contractual, system and physical risks) will be assessed in accordance with the JV's EMS. Each phase of the project management lifecycle will demonstrate that a risk management approach to environmental planning and decision making has been established
- Environmental design review. Ensure the design of the project will be in accordance with requirements of this CEMP
- Environmental and sustainable procurement. Ensure procurement considers environmental requirements and responsible supply chain with a focus on minimising depletion of natural resources
- Environmental scheduling. Ensure a consolidated schedule considering environmental deliverables and assurance program during the construction phase
- Environmental completion and handover. Ensure environmental issues are closed and the site is returned in a compliant state.

4.4 Environmental governance structure

The Project will establish an environmental governance structure to actively test the effectiveness of the environmental systems on work implemented. Through risk management and assurance processes, hazards and risk will be identified and managed so far as is reasonably practicable. Environmental information will be used to prevent risks which have the potential to result in environmental harm. Subcontractors will actively participate in joint assurance activities with the project.

Governance processes will be aligned to the JV's EMS.

4.5 Environmental accountabilities & responsibilities

The JV will define environmental accountabilities and responsibilities for all applicable project roles. These will be clearly defined for personnel making environmental decisions for the Project. Each person will be made aware of their environmental responsibilities via position descriptions or role statements, as well as through inductions.

4.6 Environmental due diligence

The JV will ensure staff understand and can demonstrate how environmental risks on the Project are managed. These personnel will have access to risk and assurance information and will be trained and be competent to discharge their legal obligations. Training and competency records will be maintained in the HSE training matrix.

4.7 One HSE Culture

The One HSE Culture Framework is presented in Figure 6 below. The CopperString 2032 project will implement the framework and assess cultural maturity at regular intervals. A baseline will be established soon after Project commencement, followed by setting practical and achievable actions for improvement. Performance progress outcomes will be communicated to the workforce.

THEME	EVERYONE	SUPERVISORS	MANAGERS
Risk management	Understand hazards	Promote risk awareness	Challenge and improve
Standards	Follow rules	Positively reinforce	Set high standards
Communication	Speak up	Encourage the team	Maintain openness
Involvement	Get involved	Involve the team	Provide support

Figure 6 One HSE Culture Framework

All JV Project personnel play a part in creating the One HSE Culture and therefore the behaviours are defined for supervisors, managers and everyone. The 'everyone' behaviours apply to everyone, regardless of their role. In addition, employees in supervisory and management roles should also demonstrate the behaviours relevant to their role.

The behaviours underpinning the One HSE Culture Framework are grouped into four broad themes – risk management, standards, communication and involvement. Each theme is supported by a set of detailed positive ('I will') behaviours.

Some examples of how the framework can be used include:

- Inductions – to communicate expected behaviours to staff and subcontractors
- Audits and reviews – to identify and close gaps in existing culture
- Leadership programs – to build and reinforce the skills needed to achieve desired culture
- Reward and recognition programs – to recognise people or projects that are demonstrating positive behaviours and contributing to achieving excellence

- Incident reviews – to ensure behavioural aspects of incidents are captured and addressed.

4.8 Lessons learnt

The JV management will encourage and support the reporting of environmental hazards and near miss events. Lessons learnt will occur at major project milestones, upon project completion and from incident investigations. Lessons learnt will be communicated to the workforce. All incidents, near misses, hazards and environmental actions will be reported into Synergy and to PQ.

4.9 Environmental performance reporting

The JV will establish an environmental performance reporting process which:

- Aligns with and adds value to environmental planning
- Benchmarks performance
- Identifies trends that allows for early intervention.

The JV will communicate the Project performance and actions to the workforce on at least a quarterly basis.

4.10 Key performance indicators

The Project will establish KPIs. Both lead and lag indicators will be used and specific, measurable, attainable, relevant and time-bound (SMART) goals will align with the environmental targets and objectives.

Project KPIs have been identified as part of this CEMP as tabulated below.

Table 12 Project key performance indicators

Key Performance Indicator	Target	Time Frame	Actions to be Taken	Accountability
Class 1A & 2A, 1P, 2P environmental incidents (As per Synergy classifications)	Zero incidents of these categories	Ongoing	Implementation of the CEMP	Project Director
Corrective actions taken by regulators and/or client	Zero	At all times	Implementation of the CEMP	Project Director
(Environmental and Sustainability) Compliance	100% compliance with approval conditions and EIS commitments	At all times	Implementation of the CEMP	Project Director
(Environmental and Sustainability) Assurance	Completed on schedule No repeat non-conforming findings	At all times	Implementation of the CEMP	Environment Manager
(Environmental and Sustainability) Reporting	Completed on schedule Accurate and comprehensive	Monthly	Reporting as per contract and system requirements	Environment Manager
Natural resources consumption	Monitor and trend energy, water and materials Minimise consumption where feasible Maximise reuse and recycling	At all times	Sustainable procurement Data review Management of Change	Project Director

5. Key Roles & Responsibilities

5.1 National Environmental Manager

The National Environmental Manager (NEM) has overall responsibility to maintain the JV's EMS and to share Lessons Learnt across the division.

5.2 Project Director

- Govern environmental management across the Project
- Support a proactive approach to environmental management
- Ensure environmental responsibilities are defined and appropriately and competently resourced
- Ensure the risk management framework is implemented throughout the project
- Lead the implementation of the One HSE Culture by consistently displaying behaviours aligned to the framework for Managers.

5.3 Design Manager

- Environmental design criteria are considered and met by design as per the CoG Report/MID. The environmental design process is documented in this CEMP in Section 7
- Design and select materials having regard to sustainability outcomes for:
  - Greenhouse gas emissions
  - Circular economy
  - Responsible supply chain
- Design complies with all additional approval requirements (refer to RAP)
- Ensure environmental deliverables are considered in the design schedule for effective integration
- Make changes to design in accordance with:
  - Environmental Constraints Checklist recommendations
  - Scouting recommendations.

5.4 Project Leadership & Supervisors

- Ensure workers are made aware of their environmental responsibilities
- Fulfil the requirements of the JV risk management processes and consult workers when identifying, assessing and applying controls to hazards
- Ensure workers are provided with appropriate resources, training and education in the EMF
- Demonstrate behaviours aligned to the One HSE Culture Framework for Managers and Supervisors
- Ensure commercial and procurement processes imbed environmental requirements for vendor and subcontractor selection, management and purchasing
- Provide evidence of compliance with risk-based environmental management controls able to withstand legal scrutiny.

5.5 Environmental Manager

- Ensure the JV commitment to the environmental management of works under contract is realised
- Identify and obtain all relevant environmental approvals including liaising with regulators and stakeholders as required
- Manage the environmental budget and procurement of environmental supplies
- Ensure the EMF and implementation strategies are imbedded in work practices
- Ensure the effectiveness of environmental management on all the JV work activities
- Ensure environmental risks are identified and managed in accordance with this plan and related EMF

- Ensure any outstanding environmental issues are resolved prior to project completion
- Manage internal applicable or Client required environment approvals
- Implement sustainability initiatives.

5.6 Environmental Advisors

- Confirm that all necessary environmental controls are implemented and maintained for the duration of the contract
- Prepare and issue Land Access Permits (and other internal permits) and environmental components of workpacks
- Verify environmental compliance
- Supervise high-risk environmental activities
- Undertake/coordinate all environmental studies/monitoring/other
- Participate in project meetings
- Complete environmental reporting
- Promote environmental awareness and deliver environmental training throughout the course of the project
- Complete and maintain all necessary environmental documentation for the contract
- Investigate all incidents, non-conformance events and ensure these are corrected
- Review the suitability of ongoing environmental controls on site during inspections and advise of any improvements
- Support the Environmental Manager to obtain approvals, review this Plan and reviews.

5.7 Workers – Including Contractors

- Comply with EMF requirements
- Actively support and participate in environmental consultation and other activities (including training)
- Assist managers and supervisors in applying appropriate environmental measures
- Report hazards, incidents and opportunities for environmental improvement
- Demonstrate behaviours aligned to the One HSE Culture framework.

6. Risk Management

6.1 General

The JV project management will ensure that risk management processes are integrated throughout the lifecycle of the project. Each phase of the project management lifecycle will demonstrate that a risk management approach to environmental planning and decision making has been established.
The Project has an established comprehensive approach to risk management. This includes:

- Risk identification, assessment and analysis
- Qualitative likelihood and consequences criteria
- Quantitative risk assessment techniques
- Risk evaluation and treatment.

The following sections provide an overview of how risk management elements from an environmental perspective will be identified and controlled.

6.2 Identify environmental aspects (hazards)

The JV will develop a project specific live Aspects and Impacts Register in accordance with the JV EMS relevant environmental risk procedure (UGLMS-131-342). The register will:

- Identify perceived risks associated with each environmental aspect, as well as mitigation or control measures and any remaining residual risk
- Be set in a phased structure so that persons responsible for leading each phase can easily identify the environmental aspects that need to be controlled and the actions required to be taken.

This register will be a key information source for the development of the combined HSE Risk Register and any other environmental management planning activities. Where the JV scope changes the Aspects and Impacts Register will be reviewed and updated as required, before reviewing the HSE Risk Register.

6.3 Manage environmental impacts (risks)

The JV has identified and manages key environmental impacts associated with programs of work including business as usual activities; critical and key risk work activities; organisational changes; change management; emergency management and environment in design.

Responsibilities and accountabilities are assigned to key project personnel throughout the project lifecycle to ensure the environmental impacts are identified and controlled.

The Aspects and Impacts Register is a working document developed with the most current understanding of the environmental conditions, potential impacts, design and work practices expected on the project. As elements of the work are delivered or completed, the register will be reviewed to remove aspects that are no longer present and add new or future aspects as they become relevant. This register will be environmental risk assessed and documented prior to works in order to identify the relevant environmental requirements and approval conditions that require control measures to be implemented.

All mitigation measures identified in the approval process and during the project planning phases will be listed in the CEMP Sub Plan control tables along with the objectives, targets, key legislation and guidelines, monitoring and reporting.

6.4 Manage actions

The Environment Manager will implement and maintain a process to ensure risk assessment actions are identified and managed to ensure control effectiveness. Assurance activities will be performed to ensure identified controls are in place. Actions arising out of the Aspects and Impacts Register will be monitored and tracked in Synergy.

7. Environment In Design

This CEMP identifies significant environmental constraints which must be considered in design to achieve:

- Environmental outcomes and compliance with project approvals
- Alignment with the EIS 'Field Development Plan'.

The JV proposes an environment in design process (for each section/work package/other) as follows:

- Development of an overarching project Environmental Geographical Information System (GIS)
- Development of an overarching project environmental constraints checklist
- Implementation of the UGL Safety in Design Guideline (UGLMS-131-629), with the completion of Construction Hazard Assessment Implication Review (CHAIR) or Hazard and Operability (HAZOP) Review Workshops at 15%, 40% and 80% design stages (refer to the Design Management Plan for further detail)
- Reviewing pre-clearance (ecology) surveys (Client led), additional baseline investigations and waterway assessments required to fulfil EIS knowledge gaps no later than at 40% design (subject to land access)
- Scouting (onsite verification of design) at 80% design
- Environment Constraints Assessment (ECA) Report to demonstrate design compliance.

For each of the above process steps refer to details below.

(Note, where these requirements are addressed by Client documentation, this CEMP will be updated).

7.1 Environmental Geographical Information System (GIS)

The JV will develop a Geographical Information System (GIS) that identifies the environmental values along the alignment and at any ancillary construction locations including locations proposed for:

- Property access
- Camps
- Water sources
- Borrow pits (where part of the RAP due to haulage distance from established licenced quarries)
- Other as considered essential and which formed part of the MID application.

The Environmental GIS will at a minimum map:

- Disturbance boundaries
- Cultural heritage exclusion and monitoring zones (as these are developed in consultation with the Aboriginal Parties)
- State mapped habitat for threatened species (used to inform threatened species disturbance limits)
- Field verified threatened species habitat (developed via pre-clearance surveys)
- Approved clearing methods (based on habitat sensitivities)
- Weed locations (developed via pre-clearance surveys)
- Habitat features for retention
- Agreed access points to properties and approved for use tracks within properties
- Washdown locations
- Fences and internal tracks
- Approved water sources
- Approved borrow pits
- Mapped waterways
- Field verified waterways including bed and banks
- Mapped watercourses and drainage features/other flow paths
- Sensitive receptors (amenity)

- Mining/exploration leases
- Stock routes
- Other as determined a relevant to constraint mapping.

The Environmental GIS will be created for use offline to support works in non-serviced areas ensuring compliance tools are available at all times.

The Environmental GIS will transition to a ready reckoner infield enabling workers to:

- Be aware of site boundaries (prior to marking out, for example during scouting)
- Verify and manage environmental values on ground
- Upload any new finds/other.

The Environmental GIS will be maintained on a platform and be accessible offline in field to all workers on mobile devices, due to remoteness, with updates managed by a dedicated GIS role.

7.2 Environmental constraints checklist

During detailed design, the preferred layout at 40% design completion will be reviewed using the GIS environmental attributes in accordance with a proposed Environmental Constraints Checklist (modelled on the requirements of the EIS “Field Development Plan”) having regard to the EIS concept tower and infrastructure plans (Supplementary EIS, Attachment C and D), and detailed design as this progresses.

The Environmental Constraints Checklist will identify at a minimum the following design criteria to be achieved.

- Micro-siting of linear and non-linear infrastructure as per Appendix 5 of the CoG Report
- Locating temporary and permanent infrastructure in existing cleared areas to minimise ground disturbance (CoG Report Appendix 4 Commitment 77)
- Avoid/minimise disturbance of verified threatened species habitat, specifically towers have been sited to avoid key ecological impacts to breeding, nesting or refuge sites for the black throated finch, squatter pigeon, dunnart, ornamental snake, greater glider and koala (CoG Report, Appendix 4, Commitment 53)
- Access tracks contained within the transmission line easement where practical, with use of existing cleared access tracks preferred for construction use where practical
- New access tracks are no greater than 6m in width (including any erosion and sediment controls likely) and reduced to single lane through waterways
- Existing crossings of waterways are used where practicable (CoG Report Appendix 4 Commitment 62)
- Where existing crossings of waterways cannot be used the footprint of a new crossing will be minimised (CoG Report Appendix 4 Commitment 62)
- Transmission lines span riparian habitat corridors where possible, including the use of taller line structures to avoid direct impacts to waters (CoG Report Appendix 4 Commitment 52, 75, 80) to maintain bank stability (CoG Report Appendix 4 Commitment 76)
- Transmission towers to maintain a mid-span clearance above local terrain in compliance with Queensland legislation (CoG Report Appendix 4 Commitment 3)
- Avoid Environmentally Sensitive Areas – various (CoG Report Appendix 4 Commitment 149)
- Meet the Accepted Development Requirements criteria for mapped waterway crossing (CoG Report Appendix 4 Commitment 81)
- Salinity expression areas have been avoided (CoG Report Appendix 2 Part B Condition 36)
- Mitigated impacts to visual amenity including consideration of tower heights, tower placement and vegetation screening for substations (CoG Report Appendix 2 Part B Condition 48)
- At risk erosion sites have been avoided where possible to minimise controls required to be implemented during construction including:
    - Disturbance on steep slopes >20%
    - Undulating ground

- Cultural heritage exclusion zones have been avoided (CoG Report Appendix 4 Commitment 34)
- Least disturbance footprint
- Permanent infrastructure has appropriate flood immunity (CoG Report Appendix 4 Commitment 85)
- At risk biosecurity zones have been avoided where possible
- Separation distances to sensitive receptors are maintained as far as practical (CoG Report Appendix 4 – Commitment 38)
- Impact to landholder agricultural/farming practices avoided to minimise impact to agricultural production (CoG Report Appendix 4 – Commitment 40)
- Mining/exploration leases have been avoided where practical (CoG report Appendix 4 – Commitment 41)
- Stock routes have been avoided where practical (CoG report Appendix 4 – Commitment 42)
- Habitat fragmentation has been avoided or minimised (CoG Report Appendix 4 – Commitment 40 and 54)
- Preferential location of temporary and permanent infrastructure in areas of non-remnant or least concern vegetation (CoG report Appendix 4 – Commitment 55)
- Avoid disturbance to semi-evergreen vine thicket (CoG Report Appendix 4 – Commitment 58)
- No authorised clearing of listed threatened flora species including Black ironbox, Pink gidgee and Waxy cabbage palm.

The Environmental Constraints Checklist will be completed by a Suitably Qualified Person in consultation with the design team at a dedicated planned hold point (meeting format). At this stage of design, changes may be recommended based on available data.

7.3 Additional environmental studies

In order to inform the environmental constraints review, additional environmental studies will be required as per EIS and approval conditions (staged in accordance with the MID/work package/other) prior to construction commencement including:

- Pre-clearance surveys (scope as defined by approval conditions) (Client Obligation)
- Geotechnical investigation (Early Works scope)
- Baseline weed surveys (Client Obligation)
- Cultural heritage pre-clearance surveys (Client Obligation)
- Waterway assessments (Early Works scope) at infield locations (compared to the mapped location), to identify physical and hydrological fish habitat attributes (aligned with AusRivers sampling sheets excluding aquatic and water quality sampling), and determination of waterway criteria, additional to details in EIS Volume 4 Attachment F (Note, while this is commencing during early works, these assessments will continue during detailed design and be managed as a secondary approval – refer to proposed RAP).

Digital data from these additional environmental studies will be uploaded to the Environmental GIS.
As per approval requirements, any changes to the mapped extent of threatened species from field surveys will be discussed with the Commonwealth Environment Minister.

7.4 Scouting

The JV will implement a scouting campaign to assist with detailed planning of works (at 80% design). Scouting will also provide design inputs including:

- Identification constraints which may require relocation of structures and access tracks (both linear and non-linear siting requirements)
- Assessment of structure and access track locations from a constructability perspective.

At this stage in design, additional plans under development will be available for consideration including:

- Progressive Certified Erosion and Sediment Control Plans (P-CESCPs) – staged approach

- Threatened Species Management Plans
- Cultural Heritage Management Plans/Strategy (Client Obligation)
- Consultation outcomes with third parties including: landholders, community, infrastructure operators, Local Governments, State Agencies, other.

Scouting comprises key stakeholders with expertise in civil supervision, survey, contractor (if available), cultural heritage, land access, ecology and environment to inspect land of future works in advance of the work party to plan/identify:

- Positioning of key and ancillary infrastructure as per the requirements of the “Field Development Plan” (as per design requirements in Section 7.2)
- Avoidance of contamination and historical workings, and existing infrastructure (CoG Report Appendix 4 Commitment 34)
- Construction methodology
- Land and water management (eg. Site specific erosion and sediment controls, washdown bay locations demarcation of environmental features)
- Location of potentially contaminated land identified through discussions with landholders (CoG Report Appendix 4 Commitment 44)
- Unexpected finds/exclusion zones, property infrastructure, other.

Scouting may result in minor changes to design to ensure alignment, minimise need for secondary approvals and maximise environmental outcomes in construction.

Results from scouting are also intended to inform:

- Works scheduling (refer to Section 15.8)
- Environmental procurement
- Enabling works requirements, for example:
  - Requirement for rapid fauna surveys (max) 10 days in advance of scheduled clearing
  - Barricading exclusion zones
  - Access stabilisation
  - Fences/gates management
  - Weed control etc.

7.5 Environmental constraints assessment

Post completion of additional environmental studies and scouting, an Environmental Constraints Assessment (ECA) (report format) will be prepared for each works package.

This report will be table based and identify the alignment of the design with the project environmental requirements and any secondary approvals. Where any exceptions to design criteria are identified based on design constraints, this ECA will identify required amendments to conditions of approvals.

As part of the ECA process, a Disturbance Drawdown Register will be maintained to track the designed threatened species habitat loss, compared to the total cumulative values to ensure availability across the alignment/no exceedance on design completion (100% design), and updated as required based on actual survey clearing data.

This approach is evidence of adaptive management and consistent with best practice planning.

8. Environmental Assurance

8.1 Legal obligations assurance and other requirements

The Project will:

- Identify environmental legislation and approvals relevant to the project
- Establish a mechanism to enable personnel access to the legislation
- Implement a process to stay current with legal compliance requirements
- Adhere to Land Access agreements and bio-security plans specific to landowners.

As part of the review process, legislative and other requirements applicable to the project scope have been identified in the preliminary **Legal Register located in Appendix C**. The JV Environment Manager will ensure that all applicable (environmental and planning related) approvals, permits and licences are held for the Project.

All relevant environmental legal requirements are identified at a corporate level and recorded in an Environmental Legal Register. A review of legislative changes and their impact on the JV's operations is conducted quarterly at a corporate level and communicated to site through the HSE team via Environmental Alerts. Changes to local legislative and other requirements are reviewed by the National Environmental Manager (EM). Subsequent changes to Appendix C and other areas of the CEMP will follow to ensure legal compliance.

A detailed Compliance Register will be maintained on site and include:

- Regulatory approvals tracking
- Conditions of approval
- Report commitments relevant to each approval obtained.

A copy of the project **Regulatory Approvals Plan is in Appendix D**.

8.2 Environmental assurance program

8.2.1 Site check it planner

The Project will implement and maintain an assurance program that ensures elements of the system are working together to effectively manage risk.

The assurance program will consider:

- The JV system requirements
- Contractual requirements
- Regulatory requirements.

The project will develop a Site Check It Planner (based on the template UGLMS-4-993) that includes minimum project environmental requirements. This tool is used to ensure compliance with elements of this CEMP.

Minimum environmental assurance requirements applicable include:

- Mobilisation (integrated HSE) audit
- Daily environmental inspections completed by the Site Supervisor
- Weekly environmental specific inspection completed by a Subject Matter Expert
- CEMP compliance audit initially within 3 months and then annually
- CEMP review at 6 months including review of the Aspects and Impacts (risk) Register.

The frequency of environmental assurance activities and specific monitoring criteria will be assessed periodically throughout the project to ensure that they are commensurate with the current level of risk to the environment.

All findings and actions of the assurance program will be recorded in Synergy. An achievable close out timeframe should be discussed with all involved in the item to ensure it has sufficient time to be actioned and is therefore actioned by that date.

The Project Director is responsible for ensuring that Check It Planner activities are completed in accordance with the schedule each month.

8.2.2 Inspections

The JV will undertake inspections in accordance with the UGL HSE Inspections Procedure (UGLMS-131-349).

Daily environmental inspections by the Site Supervisor will consist of standard indicators of environmental health of the project. A digital checklist will be created for this activity.

Weekly inspections will be undertaken by the Environmental Advisor with field Supervisors using the UGLMS template available and made specific to the project requirements specified in this CEMP as part of the project's compliance framework. The template used will be digital in format preferably for Power BI analysis and reporting to Senior Management on compliance status.

8.2.3 Audits

The JV will plan and conduct audits in accordance with the HSEQ Audit and Assurance Program Management Procedure (UGLMS-131-740), and in consultation with the Client/Stakeholders.

Environmental audits will be undertaken by suitably qualified persons.

A CEMP Audit Criteria template is available on UGLMS. Key components of the audit will be implementation of legal and other requirements (e.g. project approval conditions, contract specifications, system procedures).

Corporate environmental audits will be undertakes as required by the Corporate assurance program. A Synergy environmental audit template is available.

8.2.4 Environmental monitoring

As part of the JV assurance program, environmental monitoring will be conducted in accordance with the relevant technical (aspect specific) Plans. At a minimum this will involve:

- Water quality monitoring of discharges, bypass pumping, downstream of waterway barrier works (when works are being undertaken in times of flow), drinking water, construction water sources (eg. dams, other)
- Groundwater monitoring of bores used as construction water sources
- Noise/air/vibration/odour monitoring in the event of a complaint
- Weather monitoring for forward planning and actual reporting
- Soil monitoring for defining erosion and sediment control types and locations, including salinity expression areas
- Cultural and European heritage monitoring as required by location specific plans/unexpected finds (Client Obligation, coordinated by the JV)
- Contaminated land or acid sulfate soil sampling in the event of unexpected finds, dependent on early works field investigations.

An environmental monitoring schedule will be developed to execute monitoring requirements.

Environmental monitoring will be captured in aspect specific data sheets with interpretation/analysis triggers built in to enable immediate intervention of a risk/incident/other.

8.3 Compliance register

The JV will maintain a “Compliance Register” to record and readily understand the status of compliance with the environmental management requirements of this CEMP. The Compliance Register will be supported by environmental records.

The Compliance Register will be reviewed quarterly as part of the CEMP assurance program and updated at this point in time. The Compliance Register will be spreadsheet format. The Compliance Register will identify:

- Conditions of approval and CEMP environmental management requirements
- Interpretations (of approval conditions where required)
- Evidence strategy for each approval condition and management requirement
- Compliance / evidence records (links to)
- Compliance assessment summary (point in time)
- Compliance status (point in time).

Every regulatory approval condition/environmental management requirement will be assessed for compliance at least annually.

8.4 Non-conformance management

Environmental non-conformances are situations or events that do not comply with the safeguards and procedures stipulated by this CEMP based on system and contractual requirements, where not deemed an incident (refer to Section 9 below).

Note, non-conformances do not include non-compliances with legal requirements. These are to be managed as an incident (refer below).

The JV will prepare a specific incident and non-conformance management procedure for environmental aspects to guide event classification for the project based on the legal framework.

Any such finding is to be documented and kept up to date by UGL in Synergy which tracks and documents Recommended Improvement (RI) and Non-Conformances Request (NCR).

Any corrective and preventative action plans identified are to be implemented by the JV to the satisfaction of the Client. Records of all non-conformances and corrective action plans shall be held onsite for inspection by relevant authorities (if required).

An Action Plan in response to any external audit incidents and non-conformance results will be prepared within 10 business days of the audit and issued to the Client. A collaborative approach to external auditing between the JV and Client will be undertaken to ensure best for project outcomes.

9. Incident Management

9.1 General

The Project has established a comprehensive approach to the management of major or catastrophic incidents which aligns with PQ Incident & Emergency Management processes and includes:

- Severity classification and assessment
- Notification and escalation to the Client where required
- Incident leadership
- Incident and emergency response structure
- Incident management team and structure
- Reporting.

The following sections provide an overview of incident management aspects from an environmental perspective. Where an incident is determined to be major or catastrophic event, such as major sewage spill, the Emergency Response Plan (ERP) will be applied in addition to the following requirements.

9.2 Reporting and managing environmental events

The JV will implement and maintain a documented process that ensures workers can report all environmental events. Synergy will be utilised as a system for records.

Environmental events may include:

- Incidents (physical environmental harm, Stakeholder matters and regulatory breaches)
- Near hits/miss where there is potential for environmental harm to be caused.

9.3 Notifiable incidents

The National Environmental Manager and PQ will be notified of any potential notifiable (external) incidents. The JV will implement and maintain a process which will include consultation with PQ for reporting notifiable incidents to the relevant Regulator.

Environmental incidents will be reported in accordance with the requirements of local, state and federal government regulations by the Project Environment Manager.

9.4 Investigations

The Project will implement and maintain a process to ensure environmental incidents are investigated. Levels of investigation will depend on incident severity as outlined in “Synergy” and in the JV Incident Management procedures, whichever is more stringent.

Personnel undertaking incident investigations will be trained in incident investigation methodologies such as ICAM. PQ and any parent companies can be involved in these investigations as deemed necessary at the time of the event in consultation with the Project Director.

9.5 Manage & track environmental actions

All event actions will be documented and tracked using Synergy and reported to PQ as required.

The Project will implement and maintain a process to ensure regulatory notices are complied with and if relevant, environmental actions are tracked and carried out.

10. Emergency Response Management

10.1 Emergency response planning

The Project will:

- Implement and maintain a documented process to identify potential environmental emergencies for all work areas
- Ensure site-specific Emergency Response Plans and procedures are developed and regularly reviewed for identified potential environmental emergencies
- Ensure emergency response arrangements are communicated to all personnel and visitors attending work sites.

The Project Director will ensure designated emergency response personnel have:

- Been inducted in the site-specific emergency plans and procedures
- Obtained any qualification or formal training determined as being required.

The Project Director will ensure emergency response practice drills:

- Are scheduled and carried out on site at least 6 monthly
- Are scenario based and test a variety of the identified potential emergency (environmental) situations
- Are recorded and evaluated for effectiveness
- Enable review of the effectiveness of the response procedures
- Incorporate a process for the identification and management of corrective actions.

The Project will ensure there is a process for defining a critical incident or emergency and escalation.

10.2 Emergency response equipment

The Project Director will:

- Ensure a qualified person identifies and provides the project with necessary environmental response equipment and requirements in accordance with the relevant legislation, codes of practice and Australian Standards
- Ensure a competent person identifies site emergency response equipment and requirements
- Ensure there is a process for annual inspecting, testing and maintaining emergency and first aid equipment.

Environmental emergency equipment will include at a minimum:

- Stockpiled erosion and sediment controls including flocculants
- Dewatering equipment (eg. Pumps, pipe/hose, dewatering socks)
- Lime bags (for sewage spills)
- Regulated waste bins (for contaminated products/soils)
- Fire fighting equipment
- Spill waste containment.

Nearby working plant and equipment necessary to undertake environmental emergency measures (eg. excavators, water carts, other) will be immediately reallocated to the emergency as required.

11. Consultation & Communication

11.1 Establish internal consultation arrangements

The project will implement consultation arrangements with personnel to provide an opportunity for workforce participation and representation in environmental initiatives, identifying risks and issues, sharing views and risk control information, and contributing input to the decisions made in relation to environmental management.

Mechanisms for sharing environmental information with workers, duty holders and others will include:

- Environmental kick-off meetings
- Joint environmental inspections
- Supervisors/project daily/weekly meetings – standing environment agenda
- Pre-starts (standing environmental agenda items and area/work specific messaging)
- Environmental Toolbox Talks
- Dedicated environmental SharePoint on the JV intranet
- HSE Alert system
- Posters, Notice Boards, other visual aids
- Work packs and work pack briefings
- Distribution of environmental assurance findings to key subcontractors; and
- Quarterly environmental performance brief to staff and workers.

11.2 Interface with stakeholders

The project has developed a Stakeholder and Engagement Management Plan that identifies the communication protocol for environmental interfaces including with:

- Landholders
- Aboriginal Parties
- Registered entities for railways, roads, electrical, water and gas crossings
- Government Agencies
- Interested community groups.

All consultation and communication will be undertaken under guidance of the Stakeholder Engagement Manager. All environmental correspondence with Stakeholders will be recorded in a dedicated Stakeholder Register managed by the Stakeholder Engagement team.

This CEMP addresses internal JV environmental communications as tabulated below. PQ will be responsible for external reporting to agencies in accordance with statutory requirements including approval and consent conditions.

Table 13 Communication with regulatory authorities, community and stakeholders - Environment

Subject	Action	Recipients	Timeframe
Environmental Impact - Event causing or threatening to cause material harm to the environment Encountering heritage	Environment Manager to verify, notify the Project Director and determine whether the event is notifiable. Project Director to notify the Client. Reporting notifiable incidents (as per Section 16-17 of the EP Act) to the Department of Environment and Science will be in accordance with guideline "Duty to Notify". Notifiable reporting will be conducted by the Client. Reporting notifiable incidents (as per EPBC approval conditions) to the Department of Climate Change, the Environment and Water. Prior to any notification occurring, the Project Environment Manager must notify the National Environmental Manager/GM HSE.	PM > GM HSEQ and NEM, Client. Regulatory Authorities (if required after consultation with the Client) As per Client communication matrix	Immediately to Client Within 24 hours if notifiable of "becoming aware"
Environmental incident – non-compliance (not notifiable)	Environment Manager to notify HSE Operations Manager. Environment Manager to notify Project Director. Project Director to notify Client within 24hrs.	Project Director, Environment Manager, HSE Manager, Client	24hrs
Near Miss	Supervisors to notify Environment team.	Supervisor, Environment team	24hrs
Non-Conformance	Environment Manager notifies Client that a Non-conformance has occurred and recorded in SYNERGY.	Environment Manger, Client	7 days
Environmental Actions Request/ Instructions	Verbal communication prior to recording in SYNERGY, meeting minutes or Issues register.	Project personnel responsible to complete the action or task	24hrs
Environmental related Complaints	Record comms in SYNERGY and notify Project Director who will notify the Client. Project Director to notify the Stakeholder Engagement team. Stakeholder engagement team to notify the Environment Manager if environment related	Project Director, Client, Stakeholder Engagement Manager, Environment Manager	Immediately
Media Enquiry	Record comms in SYNERGY and notify Project Director who will notify the Client. Project Director to notify the Stakeholder Engagement team. Stakeholder engagement team to notify the GM HSE Manager.	Project Director, Client, Stakeholder Engagement Manager, HSE Manager	Immediately
Permit Conditions	Compliance and reporting (where required). Environment Manager as per agreed contractual reporting. Client to submit all required documents for review/approval to external parties. Client to complete all permit notifications unrelated to incidents.	Environment Manager, Client, Regulatory Body	As indicated by permit (reporting schedule to be developed)

11.3 Stakeholder issues resolution

The project will have a process to escalate environmental stakeholder issues and resolve them promptly. Agreed solutions will be communicated to the workforce and or stakeholders impacted by any such issues. Records of issue resolution will be maintained.

Dependent on the issues, this CEMP may be reviewed to record any changes to operational controls.

11.4 Complaints/enquiries/media of an environmental nature

Complaints, enquiries, media requests other of an environmental nature will be managed by the JV Stakeholder Manager in partnership with the JV Environment Manager. The JV Environment Manager in response to being notified of a complaint will:

- Review the validity of the complaint in consultation with internal Stakeholders and provide an early response to the proposed actions within 24 hours to the Stakeholder Engagement Manager.
- Investigate the complaint in accordance with the proposed actions within the agreed timeframe which may involve:
  - Site inspections
  - Verification against approval authorisations and impact assessments
  - Interviews (other ICAM investigation methods)
  - Field (and laboratory) monitoring.
- Consult with internal Stakeholders on recommendations for management dependent on the investigation findings.
- Provide a summary of the investigation including evidence obtained to the Stakeholder Engagement Manager for consultation with the complainant.
- Record the investigation findings and agreed actions in Synergy allocated to responsible persons and monitor close out as per agreed timelines.

Complaints will be managed using a tiered approach depending on:

- Their nature
- Scheduling of works
- Sequence of leading events and
- Consequence and likelihood assessment of repeats.

For enquiries/media/regulatory contact, the response by the JV Environment Manger will depend on the context, risk and location.

12. Capability & Training

12.1 General

The JV has established a comprehensive approach to recruitment and selection, and a 3-tiered training program involving:

- Awareness
- Training
- Competency.

The following sections provide an overview of environmental elements required to be taken into consideration in the execution of recruitment and training planning activities.
In addition, the JV will ensure:

- Environmental capabilities form part of position descriptions or role statements so that selection criteria can be used to engage a suitable candidate
- Qualifications and certifications are verified during the selection process
- Where dedicated environmental management roles are being engaged, the appropriate functional subject matter expert will be engaged as part of the review process to ensure specialised skills and competencies are adequately addressed.

A training needs analysis matrix will be developed and updated for the project based on the roles, responsibilities and accountabilities of the various roles on the project.

12.2 Awareness strategy

12.2.1 Staff onboarding

The project will ensure all staff complete the UGL mandatory (environmental) onboarding courses, relevant to their job family via One Learning – a CIMIC one stop shop for online training for staff.

12.2.2 HSE staff onboarding

The project will ensure all HSE professionals attend the UGL dedicated HSE Onboarding Session that introduces the UGL HSEQ management system requirements. This session is face to face presented by Senior Leadership over 2 days.

12.2.3 Site inductions

The project will ensure all personnel and subcontractors complete a mandatory environmental induction using Rapid Global. The project environmental induction will be prepared by the Environment Manager and align with the key components of this CEMP having regard to the project's roles and responsibilities matrix. At a minimum the project induction will address:

- Policies
- Objectives and targets/environmental KPIs
- Legal framework/compliance management
- Applicable environmental management framework
- Visual aids /mapping on environmental aspects
- Identification of the projects key environmentally significant aspects with a focus on:
  - Erosion and sediment control planning and implementation
  - Clearing limits
  - Exclusion Zones
  - Fauna requirements for felling, stripping, dewatering and general fauna identification
  - Fauna management

  - Biosecurity, and
  - Vegetation management
- High level summary of required controls per aspect following the format of this CEMP
- Unexpected finds process (e.g: cultural heritage finds, contamination, UXO and fauna and flora)
- Incident and non-conformance management
- Communication protocols
- Key environmental contacts.

The Environmental Induction (and individual completion records) will be maintained as current as the project progresses and will be used as a tool to effectively capture and provide learnings across the project where necessary to improve worker/subcontractor environmental performance.
A separate environmental induction will be developed for:

- Cultural Heritage requirements, as per agreed CHMPs (this may be presented by face to face by the Aboriginal Party)
- Land Access, as per agreed consultation with landholders and other relevant Stakeholders.

In addition, Client required inductions will be undertaken and may include:

- General environmental awareness
- Cultural heritage
- Land access.

Powerlink can provide the supporting information to facilitate the training required by the project.

12.2.4 Toolboxes

Environmental toolboxes will be regularly delivered in accordance with a toolbox schedule. UGL have prepared environmental toolboxes available for site use on the key environmental aspects general at our work sites that will supplement the project specific JV toolboxes developed on key specific aspects and impacts relevant to the project's values.

Toolboxes will at a minimum include the following topics within the first 6 months of construction:

- Duty of care
- CEMP compliance
- Environmental disturbance permitting
- EWMS
- Dewatering procedure
- Erosion and sediment control
- Visual indicators for contaminated land and acid sulfate soils
- Incident reporting
- Vegetation clearing
- Sustainability data reporting
- Plant and equipment hygiene requirements
- Property access rights
- Unexpected finds
- Weed identification
- Fauna injury/handling.

12.2.5 HSE alerts

The JV will issue HSE Alerts, as part of its awareness strategy (primarily) for:

- Significant incidents

- Lessons learnt
- Changes in legislation.

12.3 Training

The project will:

- Conduct a risk-based training needs analysis to determine the environmental capability needs for all roles
- Establish a process to verify competency, manage assessment records, assess training provider capability and programs for work activity suitability.

Project training can include:

- Awareness delivery methods
- Training by an internal Subject Matter Expert on specific environmental risks; and/or
- External competencies on specific environmental aspects.

The results of the preliminary risk-based training needs analysis for this project are identified in the table below. This is on the basis of:

- Ensuring the leadership team understands and prioritises environmental compliance
- Key roles are competent to deliver their environmental responsibilities
- Implementing best practice
- Compliance with approval requirements.

Note, this training needs analysis must be read in conjunction with the environmental toolbox schedule.

Table 14 The JV project environmental training needs analysis (excludes Client initiated inductions)

Aspect	Training Method			Recipients				Timeframes
	Induction (I)	Toolbox (T)*	Other (describe) (O)	Project Leadership	Construction Manager Supervisors Engineers	Environment Roles (Combined HSE Roles)	Workforce Sub-contractors (includes admin)	
Mandatory: CIMIC Group Cultural Awareness – Aboriginal and Torres Strait Islanders			One Learning	Y (O)	Y (O)	Y (O)	Y (O)	O – Employee onboarding
Mandatory: Environmental Site Induction, including cultural heritage	Yes			Y (I)	Y (I)	Y (I)	Y (I)	I – Pre mobilisation
Mandatory: General Environmental Awareness		Yes		Y (I)	Y (I)	Y (I)	Y (I)	T – Day 1
Mandatory: Spill Kit Training			Internal training (delivered by SME)	NA	Y	Y	Y	O – Week 1
Mandatory: Biosecurity			Competency – AHCBIO203	NA	Y	Y	Y	O – Prior to site mobilisation
Mandatory: Weed treatment with chemicals			Competency AHCCHM307 AHCCHM304	NA	NA	NA	Y – Weed sprayers	O – Prior to weed treatment activities
Proposed: Erosion and sediment Control (1-day course)			Competency – CPESC Training Provider	NA	NA	NA	Y – Civil contractors	Prior to earthworks commencing
Proposed: Erosion and Sediment Control (3-day course)			Competency – CPESC Training Provider	NA	Y – Civil discipline	Y	As above	O – Prior to earthworks commencing
Mandatory: EMS (ISO14001) Auditing			Competency: EMS Auditing	NA	NA	Y	NA	O – Within first 3 months
Proposed: Environmental task planning		Yes		NA	Y	Y	Y	T – Within first 3 months
Proposed: Observe Environmental Work Practices			Competency: AHCWRK202	NA	Y	NA	NA	O – Within first 3 months
Proposed: Environmental Compliance Training			Competency: Compliance Training	Y	Y	NA	NA	O – Prior to site mobilisation

Aspect	Training Method			Recipients				Timeframes
	Induction (I)	Toolbox (T)*	Other (describe) (O)	Project Leadership	Construction Manager Supervisors Engineers	Environment Roles (Combined HSE Roles)	Workforce Sub-contractors (includes admin)	
Proposed: Respond to wildlife emergencies			Competency: AHCFAU301A	NA	NA	Y – for ad hoc fauna interactions	NA	O – Within first 12 months (post clearing)

*Refer to separable toolbox schedule.

13. Environmental Mitigation Measures

13.1 Optional controls

This CEMP has been formatted to align with significant environmental aspects detailed in standalone Sub Plans. At a minimum the detailed Sub Plans have been developed to comply with the requirements herein.

Each Sub Plan will include:

- Outcomes (i.e. goals that must be achieved)
- Performance criteria (i.e. measurable goals/indicators to achieve the performance criteria)
- Applicable legislation
- Mitigation measures to be implemented
- Responsibility allocation to implement the mitigation measures
- Monitoring
- Reporting (additional to overarching project reporting as detailed below)
- Corrective action (indicative as this is generally based on the nature of the finding).

Note, the guidelines, standards and other references tabulated within this CEMP apply as relevant to each aspect.

Some Sub Plans have been identified as “overarching” meaning that additional technical, specific Sub Plans (or procedures) will be prepared in accordance with the overarching requirements during design capturing:

- Design inputs required to determine impact scale and therefore construction environmental management
- Additional environmental field studies required to inform erosion and sediment control, waterway works, rehabilitation
- Stakeholder consultation required to inform site specific environmental management
- Commitments and approval conditions that may have additional requirements not identified to date by the EIS or CoG Report (and anything that is prepared to inform the MID and required secondary approvals).

For Sub Plans included herein, refer to Section 18.

Technical Sub Plans proposed as part of the projects’ EMF during detailed design will be prepared with consideration to any existing EIS related requirements including:

- Revised MNES and MSES recommendations (Volume 4, Attachment E)
- Additional vegetation clearing and works for transmission backbone sections (Volume 4 Attachment F)
- Waste Refuse and Disposal Management Plan (Volume 4 Attachment I)
- Risk Management Plan combined (Volume 4 Attachment I)
- Community Liaison Management Plan (Volume 4 Attachment I)
- Concept Rehabilitation Plan (Volume 3, Appendix T)
- Concept Biosecurity Plan (Volume 3 Appendix U)
- Greenhouse Gas Assessment (Volume 3 Appendix V)
- Non-Indigenous Cultural Heritage (Volume 3 Appendix AA).

Quick reference to the proposed additional plans/procedures can be found in the EMF diagram, refer to Figure 5.

13.2 Measurement and reporting

Environmental performance reporting for this Project will involve:

- Daily notifications of environmental incidents, non-conformances, near miss, complaints, media, other
- Weekly reporting of environmental findings and tracking of any corrective actions/issues from weekly inspections, incidents, audits, other as a result of the implemented assurance program
- Monthly reporting of environmental training completed as a result of the implemented training program
- Measurement and monthly reporting of performance against the following in accordance with the UGL Monthly Environmental Report template (UGLMS-4-1765 – made project specific):
  - Environmental KPIs and aspect specific performance criteria
  - Environmental monitoring data (compared to relevant objectives)
  - Sustainability metrics including but not limited to:
    - Energy consumption
    - Water consumption/end use
    - Waste generation/end use
    - Materials (embodied carbon)
- Reporting of environmental approvals status
- Reporting of environmental compliance status
- CIMIC and external sustainability reporting (via Synergy) as requirement (monthly/quarterly)
- Inputs to the Annual Social Impact Management Plan Report.

An environmental reporting schedule will be developed and implemented.

14. Sustainability

The JV have developed a project Sustainability Management Plan (SuMP) (9310-JV-PLN-SMP-0023) which covers all sustainability aspects of the CopperString 2032 project. The CoG recommended MID Appendix B Condition 38 (and EIS commitment Appendix D) requires development of a Greenhouse Gas Offset Plan for construction which includes:

- energy efficiency initiatives
- consideration of the use of renewable energy sources
- consideration of options regarding Green Power or contributions to another credited offset program.

The SuMP will include the following energy efficiency initiatives, to ensure environmental outcomes in line with best practice and Government policy and limit impacts on natural resource depletion:

- Measures to divert waste from landfill and maximise beneficial use including but not limited to:
  - Kitchen organic waste as composted media, combined with paper/cardboard for soil conditioning as a natural alternative to fertilisers and may meet organic farming soil fill requirements
  - Waste timber repurposing
  - Regulated waste recovery (eg. Oily water and batteries)
  - Steel rebates including steel reels recycling
  - Landholder reuse opportunities (pursuant to the *Waste Reduction and Recycling Act 2011* requirements)
  - Balanced earthworks
  - Mulching of cleared vegetation for stabilisation and reinstatement
  - Burial of weed materials in accordance with landholder agreement
- Measures to limit waste generation towards a net zero standard
- Measures to minimise water consumption including:
  - Developing a water use hierarchy to minimise potable water use
  - Track design and maintenance to avoid water use of dust suppression
  - Feasibility assessment for installing rainwater tanks at accommodation hubs
  - Treating sewage effluent (where not connected to mains) to a class suitable for maximum reuse
  - Install water treatment as an alternative to reliance on town mains
- Measure to minimise greenhouse gas emissions due to requirement for offsetting, including but not limited to:
  - Baseline greenhouse gas/carbon modelling to evaluate trends and opportunities for trend intervention for Scope 1, 2 and 3 emissions
  - Designing solar lighting and option-engineering solar/green power at accommodation hubs
  - Feasibility assessment for hybrid generators
  - Car pooling
  - Plant and equipment authorisations based on modelling assumptions
  - Carbon credits
- Reporting, analysing and trending of sustainability metrics including:
  - Water use and release
  - Energy consumption (fuels and electricity, and materials)
  - Waste generated.

The construction aspect of the project may be required to report to the Regulator on Scope 1, 2 and 3 emissions under the *National Greenhouse and Energy Reporting Act 2007* based on the operational control triggers and criteria specified by the Act. This will be determined upon detailed design in consultation with PQ.
The project will also report as part of its monthly reporting metrics the data, and any action taken to minimise unexpected/excessive emissions/consumption/generation.

The project will also investigate monthly as part of an opportunities review, sustainability initiatives identified by the construction team. To ensure continuous improvement in sustainability, the JV will adopt a project level 'Very Best Awards', which is a monthly employee performance system. A category of the Very Best Award will be sustainability initiatives implemented.

15. Implementing Work Practices

The JV project will implement the following key work practices essential to the effective implementation of this CEMP and minimum compliance. These key practices include:

- Environmental Risk workshop
- Pre-mobilisation audit focused on readiness for day 1 compliance
- Subcontractor management (applicable to self-performing works also)
- Works Scheduling
- Environmental Disturbance Permit process
- Environmental Work Method Statements (EWMS)
- Site/activity specific Inspection Test Plan with environment hold points
- Work packs
- Dedicated environmental civil team.

The update of the projects' Construction Methodology Management Plan will integrate requirements of these work practices.

These work practices will be required to ensure site access is compliant. The Project will prepare a Site Access Management Plan (access and controls) prior to project commencement, for Client endorsement, that will:

- Detail the project's approach to project mobilisation (with reference to Section 15.1)
- Detail the project's approach to individual site access (based on property boundaries identified by PQ) with respect to:
    - Scheduling (with reference to Section 15.3)
    - Permitting (with reference to Section 15.4)
    - Work planning (with reference to Section 15.7) including:
        - Site security
        - Logistics
        - Plant and equipment
        - Construction execution (eg. Area plans, work packs)
    - HSEQ controls
    - Compliance.

15.1 Mobilisation readiness

Prior to site mobilisation, in accordance with the UGL HSEQ Planning Procedure, an environmental check as part of the pre-mobilisation review will be undertaken to demonstrate environmental readiness. This pre-mobilisation audit will verify:

- Required environmental approvals are in place
- The CEMP has fully addressed the requirements of the JV system, Client specifications, approval conditions, and best practice guidelines and sustainability options
- This CEMP has been finalised, reviewed and acknowledged by relevant Stakeholders, and issued to the Client and subcontractors
- Implementation strategies for CEMP have been identified and agreed to, with responsible parties aware of process and evidence to be maintained

- Environmental equipment has been procured to ensure compliance with requirements including but not limited to:
  - Erosion and sediment materials
  - Rock and culvert materials for temporary crossings
  - Spill materials
  - Waste bins
  - Signage, fencing and other barricading materials
  - Herbicides
  - Washdown bays
  - Water Cart/dust suppression trailer/stabiliser dispersal mechanism
  - General hardware store materials for general repairs and housekeeping.

15.2 Subcontractor management

Subcontractors must comply with the aspects of the Project environmental management framework in accordance with UGL HSEQ Contractors Requirements (UGLMS-131-807). The JV will implement the following.

- Ensure preparation of scope of works include relevant environmental specifications, translated from this CEMP and any other relevant environmental related documentation. To enable contract specific documentation, a translation spreadsheet will be used to identify requirements of this CEMP applicable to each scope of works
- Ensure subcontractors are prequalified and that environmental (and sustainability) evaluation criteria are used in their selection and award for work
- Where specialised contractors are required to use elements of their own environmental management system to undertake works, the project must demonstrate that a thorough review and approval process has been undertaken. A standard lower than that of the UGL EMS must not be approved
- Ensure all environmental system information including the Aspects and Impacts Register, CEMP and related documents required to perform the works are provided to subcontractors
- Ensure subcontractors supply trained and competent personnel, fit for purpose with experienced supervision to ensure compliance with environmental risk controls and procedures. The project will confirm this by reviewing competency records and ensuring that appropriate evidence of competency is documented and maintained for the duration of works conducted
- Supervise and monitor the work of subcontractors to ensure environmental compliance requirements are implemented
- Collect and verify monthly subcontractor sustainability reporting (in accordance with UGL's sustainably data form UGLMS-4-1470), where relevant.

15.3 Works scheduling

Environmental outcomes for various aspects are dependent on works scheduling. An integrated works schedule will be developed that addresses the following:

- Approval / submission / certification of this CEMP and Sub Plans / other EMF documents in the overarching deliverables schedule
- The following within the 2-4 week lookahead:
  - Vegetation clearing work front (timeframe/distance from stabilising earthworks)
  - Wet season
  - Stakeholder engagement requirements (as per the Community Liaison Management Plan for works notifications) including with landholders:
    - To minimise impacts to agricultural production (CoG Report Appendix 4 – Commitment 40)
    - Notify of noisy activities and helicopter (aerial) stringing of lines (CoG Report Appendix 4 – Commitment 93)
  - Waterway crossings (DAF notifications, materials delivery and construction) when scheduling access track works

  - Stockpile locations
  - Installation of erosion and sediment controls
  - Rapid Fauna Assessments/Pre-clearance verification surveys (weeds/other)
  - Required biosecurity surveys other
- The following within the 7 day lookahead:
  - Forecast wet weather
  - Property transitions/washdown timeframes
  - Environmental assurance activities
  - Deliveries outside the hours of 6.30am – 6.30pm (CoG Report – Appendix 4 Commitment 12);
  - Timing of works near sensitive receptors having regard to noise, dust, vibration and light impacts (CoG Report – Appendix 4 Commitment 10)
- Daily weather predictions.

15.4 Disturbance permit process

The JV will comply with the Client Land Access Permit requirements, identified in the contract document 'Land Access Permit (LAP) Protocol'. This entails obtaining Client approved permits for all works scheduled that will identify:

- Pre-clearance ecology status and any specific requirements
- Cultural heritage clearance status and any specific requirements
- Landholder access requirements.

The JV LAP application strategy is based on a per property with all specific activities described therein for a period of time, however as the project progresses this is likely to be amended to ensure construction methodology is not limited by property boundaries post clearing activities and existence of a construction track.

The JV will also implement an internal environmental disturbance permit for major scopes of work at a work pack/activity/subcontractor scale whichever is the most reasonable and effective. This disturbance permit will:

- Assess the scope of works in terms of environmental aspects and impacts including but not limited to:
  - Secondary approvals
  - Requirement for JV specific environmental permits including:
    - Disturb Land/Clear Vegetation
    - Dewater
    - Works are planned outside of (standard) hours.
  - Land access
  - Cultural heritage
  - Any scouting information relevant
- Translate environmental requirements (legal, system, contractual) in a format understood by Supervisors and workers including any site specific erosion and sediment controls required, which may include spreadsheet formats and/or visual format such as a Site Environmental Plan
- Provide references to other tools needed to demonstrate compliance (evidence implementation of environmental requirements).

The Disturbance Permit will involve a form completed in parts:

- Part A – Scope of works description completed by the Project Engineer
- Part B – Environmental assessment completed by the Environmental team
- Part C – Cultural heritage assessment completed by the Heritage Advisor/delegate
- Part D – Land access assessment completed by the Stakeholder Manager

- Part E – Review and approval by the Environment Manager.

Approved LAPs and Disturbance Permits will be maintained on SharePoint in a sequenced format able to be cross referenced to key work deliverables/engineering schedule. The requirement for LAPs and Disturbance Permits is a hold point to works commencing.

An Environmental Permit Register will be available for reference at any given time which tracks status of LAPs and internal Disturbance Permits.

15.5 Environmental work method statements

The JV will develop EWMS for significant environmental risk tasks for the project, aligned with key environmental control measures. At a minimum EWMS will address:

- Scouting (working ahead of the work front(s))
- Vegetation clearing
- Operation of Plant and Equipment
- Installing Erosion and Sediment Controls
- Waterway barrier works
- Weed treatment.

Optional EWMS may include:

- Refuelling
- Other high environmental risks subject to the detailed Environmental Aspects and Impacts register being developed.

Each EWMS will be presented in a similar format to a Safe Work Method Statement and require acknowledgement by all personnel involved in the task prior to its execution.

15.6 Site/activity specific inspection test plans

The JV will implement site/activity specific Inspection Test Plans (ITPs) that have been reviewed for environmental compliance. ITPs will include these minimum relevant environmental requirements as hold points:

- Environmental disturbance permit
- Environmental internal/external permit and management plan significant requirement(s)
- Environmental assurance activities
- Environmental compliance evidence/documentation required for the works (eg. Sustainability data).

15.7 Work packs

The JV will implement two work pack processes:

- Engineering work packs
- Environmental specific work packs for:
  - Fauna management including
    - Rapid fauna surveys
    - Fauna spotter catcher works during clearing.
  - Weed treatment checks and cleanliness
  - Waterway crossing construction.

Engineering work packs may be activity/area specific. The environmental interface will include inputs and sign off. A checklist will be created to ensure environmental inclusions as relevant. Engineering work packs will include relevant environmental requirements, for example:

- EWMS
- Site Environmental Plans/other, used to translate planned environmental controls to a specific site or activity which will include reference to anything site specific such as:
  - Progressive CESCP
  - Biosecurity Work Instruction per identified property
  - Rehabilitation Work Instruction per identified property
  - Bore Work Instruction per bore.
- Environment specific work packs.

15.8 Environmental responsibilities for civil teams

Owing to the nature, complexity and breadth of the environmental requirements for this project, and the focus on environmental compliance, the JV provides a breakdown of the environmental considerations the Civil team must consider for the project. The following tasks are required during construction to support ongoing production:

- Support cultural heritage investigations (where needing test pits) and relocation of any scar trees/other values
- Deployment and maintenance (clearing and refilling water containers) of property based washdown bays
- Maintenance of accommodation hub located washdown bays
- Deployment and maintenance of waste storage and portaloos within the easement and at the collection location at accommodation hubs
- Waste subcontractor management
- Installation and maintenance of erosion and sediment controls including access track and tower drainage, application of soil stabilisers, gypsum treatments/soil conditioning, other as per requirements of P-CESCP
- Maintenance of the internal track and waterway crossings during construction
- Weed treatment
- Property infrastructure repairs
- Progressive (stage specific) rehabilitation measures
- Water supply management
- Management of:
  - Hygiene declarations
  - Waterway crossing ADR compliant notifications.

These responsibilities will be included in the management of the civil teams across the project during construction and implementation.

16. Review

16.1 CEMP review

This CEMP and its implementation will be reviewed at least every six (6) months from plan approval until the date of Practical Completion. This CEMP scheduled review will be included in the assurance program/Site Check It Planner.

The CEMP review will include:

- EWMS compliance, and whether additional EWMS are required to manage high risk environmental activities
- Compliance with environmental scope of work packs
- Assurance findings and opportunities
- Environmental Aspects and Impacts Register review.

Additional triggers for review of this CEMP (or parts thereof, eg. The specific section of relevance) may include, at the discretion of the Environmental Manager:

- Results of early works field investigations and any recommendations
- Results of pre-clearance ecology surveys and cultural heritage surveys and requirements not identified as existing management measures
- Issuance of approvals with additional control requirements not managed by the assurance schedule and Compliance Register
- Reportable environmental incidents
- New construction (management) techniques not addressed by the existing environmental management framework
- Changes in the statutory framework
- Nuisance or impact triggered monitoring results and associated investigations findings/outcomes of community consultation
- Additional work scopes where aspects and impacts are not addressed by the existing technical/activity specific/related plans
- Progressive release of ECAs with construction-based recommendations not previously addressed in the CEMP as design advances.

A CEMP change may also be triggered in the form of recommendations from the Project Director, PQ or site employees.

The review will ensure the CEMP remains current and fit for purpose, addressing project risks and any negative trends such as incidents, non-conformances, unexpected finds and unacceptable behaviours linked to sustainability targets.

This CEMP shall be reviewed on a regular basis but not greater than 12 monthly intervals in accordance with the requirements specified in the Quality Management Plan.

Any specific document review triggers for the technical Sub Plans of this CEMP are addressed in each Sub Plan.

The results of the review will be provided to the Client within 10 Business Days of the review and include:

- Copy of any updated plans/other documents
- Summary of review comments/track changes.

16.2 Continuous improvement

The continual improvement process for the project is designed to:

- Identify areas of opportunity for improvement of environmental management which leads to improved environmental performance
- Determine the root cause or causes of non-conformance or deficiencies
- Develop and implement a plan of corrective and preventative action to address root causes
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Review performance against objectives and targets.

Implementation of strategies/ techniques to improve the environmental performance of the project is the responsibility of the Project Director and will involve the following means:

- Review of environmental events (outcomes, significance and implementation of corrective actions)
- Regular environmental review meetings to be included as part of safety reviews including environmental performance statistics reporting
- Innovation workshops
- Adaptive management techniques in environmental planning.

16.3 Environmental management review

An environmental management review can be called by the JV or the Client at any time to assess the performance of the JV EMS and to suggest changes to the Project's EMF.

All environmental management reviews will be recorded on a dedicated assurance Register.

An environmental management review will be generally led by the Project leadership team and involve key Stakeholders, JV corporate teams and external experts.

JV triggers that will be used for initiating an environmental management review will include:

- Repeat notifiable incidents
- Environmental KPIs consistently not being met having consideration to contributing factors.

17. Document Control & Records Management

All documentation pertaining to environmental matters will be managed in accordance with the Quality Management System, including document approval, identification, storage, protection, retention, distribution, revision, retrieval and when appropriate disposal. The JV will:

- Appoint adequate resources to ensure environmental documents are current and available
- Provide a document control system that assists users to locate environmental documents
- Ensure changes to environmental documents are communicated and change management processes are used
- Ensure PQ and all users are consulted during the development of, and any subsequent changes to, environmental documents
- Implement a documented process for controlling and storing environmental records
- Define what environmental records are required and communicate these requirements to responsible positions
- Ensure environmental records, in both electronic and hardcopy forms, are preserved from loss, damage and unauthorised access
- Identify and comply with environmental record retention times.

HSE related documentation for projects will be determined using the UGL HSE Documents Register (UGLMS-4-1309) as a guide.

Environmental related documentation required as evidence as part of the implementation of the CEMP is identified in each aspect specific section below and preceding sections. At a minimum the following environmental documentation will be available:

- Environment in design documentation (design checklists, reviews, scouting reports and ECAs)
- Environmental aspects and impacts register (combined with HSE Register)
- Environmental performance reporting (monthly at a minimum)
- Acknowledged/signed approved management plans with transmittals to the relevant Stakeholders
- Internal completed environmental disturbance permits
- Clearing records
- Monitoring data
- Hygiene documentation for plant and equipment
- Environmental registers and forms complete, accurate and current – various as referenced herein
- Training/communication records (eg. Inductions and competencies, pre-start topics, toolbox attendances, meeting minutes, regulatory/Client environmental related correspondence)
- Procurement (environmental and sustainability) evaluations
- Synergy records of:
  - Incidents, hazards, near misses, non-conformances
  - Inspections (SharePoint copies available)
  - Audits (SharePoint copies available)
  - Corrective Actions
- Environmental management reviews.

18. CEMP Sub Plans

18.1 Soil Management

Environmental Management Sub Plan: Erosion and Sediment Control Management Plan	
Environment Objectives	• Prevent impact of soil erosion or disturbance from project activities • Excavated spoil imported fill and contaminated soil to be disposed of or reused in accordance with legal requirements (safe handling of any potentially contaminated soil and material) • Minimise sedimentation and maintain water quality of waterways, watercourses and drainage lines • Ensure the viability of stockpiled topsoil • Sustainable use of quarry materials • Minimal impact on current existing visual or landscape management • all reasonable and practical measures are implemented to ensure no introduction, release, movement or transportation of biosecurity matters as a result of project activities and discharge Powerlink's General Biosecurity Obligation as defined under the *Biosecurity Act 2014.*
Performance Criteria	• No visible pollution • No spills or runoff of contaminants or sediments onto land off site or waterways • No land or soil contamination as a result of project activities • Rehabilitation of site to existing conditions or better • Implement the Progressive Certified Erosion and Sediment Control Plans • Comply with relevant approval conditions.
Legislation	• *Environment Protection and Biodiversity Conservation Act 1999* • *Environmental Protection Act 1994 and Regulation* • *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* • *Soil Conservation Act 1986*
Approvals	• As per Appendix D 'Regulatory Approvals Plan'

Monitoring	• Daily environmental inspections of ESC measures
	• Weekly environmental inspections of the P-CESCP
	• Pre and post rainfall inspections
	• Monthly inspections of effectiveness of P-CESCPs
	• CPESC Supervision of high risk activities (eg. Waterway crossing builds)
	• Water quality sampling of receiving environments impacted by sediment release (upstream and downstream) to determine environmental harm triggers as per DES procedural guideline for EP Act Section 440ZG offences
	• Prior to soil disturbance identify environmental values and water quality objectives, utilise regional data where available, if no data available: baseline water quality targets include:
	  ○ 1. Turbidity less than 75 NTU
	  ○ 2. pH 6.5 – 8.5
	  ○ 3. Dissolved oxygen ≥ 6.5 mg/L, and
	  ○ 4. No visible debris or hydrocarbons.
	• Monitoring as per requirements of the Rehabilitation Monitoring Plan for the first 12 months (reinstatement monitoring) and quarterly over 5 years (rehabilitation period).

Reporting	• Refer to incident and non-conformance management sections of this CEMP • Refer to monthly performance reporting as per requirements of this CEMP
Corrective Action	In the event of an uncontrolled release of sediment laden waters offsite/to receiving environment:

Environmental Management Sub Plan: Erosion and Sediment Control Management Plan	
	• Determine whether the event is notifiable to DES • Review the P-CESCP (update as required) • Evaluate remediation options consultation with an SQP. Maintenance (clean out/repair) of controls with reduced capacity post rainfall. Add ESC measures as required dependent on review outcomes of the P-CESCP. Undertake dewatering of controls where required in accordance with a Dewatering Permit. As per requirements of the separable aspect specific Sub Plan.

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
Pre-Construction			
18.1.1	A geotechnical investigation including soil sampling for the purposes of determining soil types and characteristics will be undertake at representative locations across the alignment (in stages if proposed) to inform the preparation of site specific (progressive certified) erosion and sediment control plans. Soil sampling will be carried out by a Suitably Qualified Person. Samples will be analysed using a NATA accredited laboratory. Soil results will be formatted in spreadsheet format that identifies the following for construction planning on a property basis: • Soil erosion risk • Topsoil depth • Soil treatments during construction • Soil treatments during reinstatement (dependent on consultation with landholders).		
18.1.2	An Overarching Certified Erosion & Sediment Controls Plan (CESCP) will be developed for the Project in consultation with the delivery team. For each staged section of works (includes towers – waterways – temporary laydowns/working areas over certain distances on easement, camps, substations and water sources), a Progressive CESCP (P-CESCP) will be prepared to identify types and locations of controls subject to final design. The CESCP and progressive plans will be prepared in accordance with best practice IECA 2008 guidelines. The Overarching CESCP will address: • Description of the environment (as relevant to ESC) • Assessment of the site (upslope and downslope environments, rainfall and time of the year • Description of the proposed works and post clearing land uses • A soil and disturbance risk assessment conducted using the Revised Universal Soil Loss Equation (RUSLE), incorporating the extent / duration of the disturbance (based on available information) • Outline requirements for progressive reinstatement for different areas based on risk • Types of ESC measures that will be required. A copy of this Overarching CESCP must be submitted to DSDILGP 2 months in advance of works as part of the detailed CEMP. P-CESCPs will:	Suitably Qualified Person (eg. CPESC)	CoG Report, Appendix B, Condition 33ai

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	• Map soil types and identify any changes to the overarching RUSLE calculation based on actual soil and catchment data (existing and as built design) • Identify the type, size and location of ESC measures prior to construction (informed by any waterway assessments and approvals) • Property specific reinstatement techniques (aligned with staged Rehabilitation Plans), note may be staged separately to the early works P-CESCPs.		
18.1.13	Training will be undertaken to ensure relevant staff (eg. Site Supervisors, Leading Hands) are skilled to be able to install, inspect, maintain erosion and sediment controls on the project.	Environment Manager	Training Needs Analysis
18.1.4	The required ESC materials to implement the P-CESCPs will be available on site. Each P-CESCP will have a Bill of Quantities for materials needed to comply with the control requirements.	Logistics Manager	P-CESCP
18.1.5	Prepare a Overarching Rehabilitation Management and Monitoring Plan (RMMP). This Plan must address: • All areas of temporary disturbance • Rehabilitation strategy (seeding, natural regeneration and weeds) using endemic native species (where feasible) • Procedures for revegetation species selection, ground preparation and sowing/planting • Reuse of hollow bearing stags, woody debris, logs and rocks • Measures to restore and reconnect habitats • Measures to ensure bank stability and water quality • Monitoring, auditing and reporting objectives for the first 5 years. A copy of this RMMP must be submitted to DSDILGP in advance of works.	Suitably qualified rehabilitation specialist	CoG Report Appendix B Condition 19
18.1.6	While the preference is to use existing licenced quarries for construction materials (fill, gravel, other), where the RAP identifies the requirement for additional borrow/gravel pits, and subject to approvals, prepare an activity specific Borrow Pit Management Plan that addresses: • Sources and access/haulage routes (for consideration in road use and traffic impact assessments) • Quantity of materials available • Process for estimating load quantities/weight • Pre and post disturbance monitoring and survey requirements • Specific rehabilitation requirements (for preparation of a stage specific rehabilitation plan). This Plan will likely be required as part of code compliant vs application triggers and therefore will form part of the RAP.	JV Project Director	CoG Report Appendix 4 Commitment 82
18.1.7	The area of disturbed land must be kept to a minimum as per design criteria (and stakeholder consultation). This includes: • Locating temporary and permanent infrastructure in pre-existing cleared areas • Co-locating infrastructure • Micro-siting towers and linear infrastructure in accordance with setbacks from ESAs • Maximum span widths and taller towers to traverse wide riparian zones and conservation sensitive habitat.	Design Manager	CoG Report – Appendix 2 and 4 Best practice Environment In Design

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
Construction			
18.1.8	All disturbance areas will be surveyed and pegged prior to construction as per design drawings.	Superintendent	Project EIS
18.1.9	For the management of ground disturbance, fauna protection, biosecurity, amenity (noise, vibration, dust, light), and other environmental impacts associated with construction traffic, traffic management will be undertaken in accordance with the approved: • Road Use Management Plan • Traffic Impact Assessment • Construction Traffic Management Plan. These documents will be peer reviewed by an environmental specialist ensuring alignment with outcomes of this CEMP and relevant approvals obtained in accordance with the Project's RAP.	The JV Project Director	CoG Report Appendix 2 Part B Condition 6-9 CoG Report Appendix 4 Commitment 50, 64, 92, 99-103
18.1.10	P-CESCPs will be prepared and implemented during each stage of the works. These will be prepared in accordance with the Overarching CESCP. Vegetation clearing (including grubbing) in advance of earthworks will not exceed the nominated timeframe unless ESC measures are installed to avoid exposed topsoil loss. In all instances, excepting where permanent and temporary infrastructure is located, the corridor's groundcover will be retained (i.e. vegetation clearing will not remove rather flatten), and standing vegetation with in the easement required for live power will be mulched.	Superintendent	CoG Report, Appendix 2, Part B, Condition 33
18.1.11	To reduce exposure timeframes, clearing of riparian areas for waterway / watercourse crossings will be delayed until construction is imminent either side of the crossing and rehabilitation will occur as soon as possible following clearing.	The JV Project Director Superintendent	CESCP
18.1.12	Watercourse works shall be undertaken within a compressed timeframe (ie. no delay between clearing, earthworks and reinstatement). Waterway / watercourse crossing works will not be undertaken during times of high flow (where feasible) / when rainfall is predicted.	The JV Project Director Superintendent	CoG Report – Appendix 4
18.1.13	Sediment laden water (dirty water) captured onsite by ESC measures installed will be preferentially reused (e.g. dust control).	The JV Superintendent	HSE Specification
18.1.14	Key considerations for implementation of erosion and sediment controls will be implemented for the project encompassing: • Ability to divert upslope stormwater/runoff to minimise erosion • Minimisation of ground disturbance and retain ground cover to reduce potential erosion surface area • Implementation of controls prior to soil disturbance other that what is required for the establishment of those controls, develop and/or implement an Erosion and Sediment Control Plan (ESCP).	The JV Project Director Superintendent	HSE Specification
18.1.15	Existing ground conditions and weather forecasts will be taken into consideration prior to conducting civil works. Excavation works will not be conducted if ground conditions are unsuitable or pose environmental risk. Vegetation clearing and construction activities located in areas susceptible to flooding will be avoided during wet conditions.	The JV Supervisor	BOM/Weather Zone CoG Report Appendix 4 Commitment 5
18.1.16	Clear instructions shall be provided to the Contractor in relation to stockpile locations for cleared vegetation, topsoil and subsoil.	The JV Supervisor/EA	P-CESCP

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	All materials that are stockpiled are to be located in areas that are already cleared and where erosion controls are in place as per the ESCP. No permanent stockpiles will remain on site unless agreed to by the Client. All materials stockpile ie. Soil must not be stockpiled within 50m of any gullies, waterways, or steep slopes.		UGLMS-131-390
18.1.17	Stringing must be undertaken using helicopters to reduce compaction from excessive vehicle movement.	The JV Supervisor	CoG Report – Appendix 4 – Commitment 20
18.1.18	As construction commences, stage specific Rehabilitation Plans will be prepared to identify and implement rehabilitation at a local scale, having regard to final landforms, landholder requirements and impacts during construction. These will be prepared in accordance with the Overarching RMMP with the required rehabilitation outcome of 70% ground cover to disturbed areas on the project once completed.	The JV Environment Manager	CoG Report – Appendix 4 – Commitment 26
18.1.19	Following construction (post tower installation), works must be undertaken progressively in accordance with the RMMP and any stage specific rehabilitation plans. All infrastructure, disturbed areas, site compounds, stockpiles, paving and hard stands areas are to be progressively rehabilitated throughout the project lifecycle. Progressive reinstatement however will not be possible at accommodation hubs until workers have demobilised.	The JV Project Director	CoG Report Appendix B Condition 19 CoG Report Appendix 4 Commitment 78
18.1.20	Rehabilitated areas shall be sign posted until rehabilitation is considered complete and area is self-sustaining. The sign will read “Rehabilitation area – Do Not Enter”.	The JV Supervisor	RMP UGLMS-131-390
18.1.21	All Rehabilitation criteria met will be signed off by the Environment Manager.	The JV EA	ITP
18.1.22	Contaminated Land sampling and analysis as referenced in section 9.11 of HSE Specifications for Contractors and Suppliers (Volume 5 – Principal Information Documents) will be undertaken where it has been identified there is a likelihood of contamination	The JV Environment Manager	HSE Specification
18.1.23	Where soil disturbance has taken place, undertake visual assessments for the presence and effectiveness of erosion and sediment control structures and measures, particular preceding significant rainfall events (within 24 hours of expected rainfall while the site is unstable, weekly inspections when rainfall is not expected or the site is stable). Records of this monitoring will be available on site for inspection.	The JV supervisor	HSE Specification

18.2 Surface & Ground Water Management

Environmental Management Sub Plan: Water Quality Management Plan	
Environment Objectives	• Minimise or avoid impacts to receiving water quality in waterways, wetlands and surface water storages • Prevent potential for flooding via effective surface water management • Maintain water quality and levels at baseline conditions • Ecological and cultural significance of springs are protected • Water sources are fit for use • No adverse impacts to surface water storages, downstream surface water users or groundwater • Minimise depletion of water resources.
Performance Criteria	• No spills or runoff of contaminants or uncontrolled sedimentation onto waterways • All dewatering meets water quality targets and is accompanied by a permit • Impacts to localised groundwater is avoided • Water source testing is undertaken and complies with guidelines • Waterway crossings do not change hydrological regimes • Track and evaluate water use and opportunities for minimisation.
Legislation	• *Environment Protection and Biodiversity Conservation Act 1999* • *Environmental Protection Act 1994* (+ regulations) • *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* • *Water Act 2000* • *Fisheries Act 1994*
Approvals	• As per Appendix D ‘Regulatory Approvals Plan’
Monitoring	• Weekly environmental inspections of water crossings, water sources and water storages • Baseline testing and ongoing monthly testing of groundwater sources • Potable water testing for drinking water supplies • Water quality testing upstream and downstream of receiving environments during works in waterways. • Water quality testing during dewatering events • Water use tracking, trending and triggers for early intervention for minimising consumption.
Reporting	• Refer to incident and non-conformance management sections of this CEMP • Refer to monthly performance reporting as per requirements of this CEMP.
Corrective Actions	Corrective actions will be defined in the specific plans required by this Sub Plan and may include but not limited to: • Water quality treatment • Remediation • Rework of waterway crossings; or • Requirement to identify new/alternative water sources. As per requirements of the separable aspect specific Sub Plan.

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
Pre-Construction			
18.2.1	Prepare a Water Quality Management Plan (WQMP). This plan must identify: • Specific measures to minimise impacts to aquatic environment during waterway crossings and working near waters (including outcomes from waterway assessments) • Water quality monitoring program including objectives • Analysis and reporting • Triggers for corrective action when downstream water quality monitoring has shown evidence of impact from construction activities. Water monitoring will include at a minimum: • Receiving water environment during works in waterways/adjacent to • Dewatering • Groundwater bore pumping (including standing water levels) • Drinking water supply (from use points at camps, offices and other storages) • Effluent monitoring (as per requirements of the Sewage Treatment Management Plan requirement). A copy of this WQP must be submitted to DSDILGP 2 months in advance of works. Note, this requirement is separate to the requirement to develop Stormwater and Drainage Plans which are applicable to accommodation hub locations and design. Note, this requirement is separate to the requirement for flood modelling and management on easement associated with tower designs.	The JV Environment Manager	CoG Report Appendix 2 Part B Condition 33aii
18.2.2	The Contractor shall ensure the responsible distribution of herbicides and cause no adverse impacts on adjacent land activities or protected fauna, flora or waterways. All ground distribution of chemicals to occur in accordance with the following: • Operation of distribution equipment is carried out by (or supervised by) the holder of a commercial operator's license or under the authority of a licensed ground distribution contractor • Distribution in a hazardous area is carried out in accordance with a Hazardous Area Distribution Permit and the prescribed conditions for the hazardous area. Refer to the Agricultural Chemicals Distribution Control Act 1966 for more information. • Liaise with and notify landholders prior to the use of chemicals (to control weeds) on properties • All methods and rates of chemical application must comply with label conditions (or a permit for off label • use). Refer to the Australian Pesticides and Veterinary Medicines Authority for more information • Careful consideration must be given to weather conditions before commencing ground distribution. As a minimum, wind direction, wind speed, temperature,	JV project Manager	Legal requirement

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	relative humidity and predicted forecast must be checked by the worker responsible for the distribution activity to determine if f weather is suitable for ground distribution of chemicals • Make and keep records for each and every ground distribution of chemicals in accordance with section 26 of the Agricultural Chemicals Distribution Control Act 1966 • Submit records to Powerlink at the completion of works under contract. Keep records for a period of 2 years after such distribution • Report any damage to stock as a result of chemical distribution to Powerlink within 2 days • Report any damage to crops as a result of chemical distribution to Powerlink within 14 days.		
18.2.3	Prepare an Activity Specific – Water Management Plan. This plan must identify: • Water sources (and access), with a preference for the use of existing licenced and authorised water sources identified in consultation with Council, DNRME and landholders • Water approval requirements • Water monitoring requirements (levels and quality) • Triggers for corrective action (i.e. when water quality or standing water levels are statistically different from baseline sampling as a result of construction activities). Prior to selection of a groundwater bore, a pump test and drawdown investigation to ensure adequate yields will be undertaken. For accommodation hubs, water proofing is proposed including: • Provision of water treatment plant and separable bore to minimise social impacts on community mains • Stormwater drainage design to collect water (ensuring no mosquito breeding habitat resulting) • Reuse of treated effluent for alternative uses including dust suppression, motor vehicle workshop cleaning, operation of the washdown bay, and plumbing of toilets and laundries.	The JV Construction Manager The JV Environment Manager The JV Camp Designer	CoG Report Appendix 4 – Commitment 4, 79
18.2.4	Additional waterway assessments will be undertaken at all known crossings of the alignment during design to identify at each crossing within the corridor selected: • Verified location of mapped waterway (compared to GIS publicly available data) • Whether waterway criteria is met at designated waterways (and to seek amendments in consultation with DAF mapping for any waterways not meeting DAF criteria) • Waterway constraints in accordance with AUSRIVERs relevant criteria (including bed and bank stability, riparian vegetation condition and hydrological fish habitat values) • Existing crossings	The JV Environment Manager	Legal requirement HSE Spec (9.8 (j))

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	• Preferred crossing location, where no existing crossings • Preferred design of the crossing in accordance with DAF Accepted Development Requirements (ADR) • Information to inform an application for development approval for major waterway crossings and any other crossings where works cannot meet ADR requirements. Where crossings that do not meet the ADR requirements, a development approval will be obtained prior to works and works conducted in accordance with the conditions of approval. A waterway barrier works approval strategy will be specifically prepared to inform the staging of the secondary approval requirements, including application triggers including: • Waterway spatial layer amendments • Engagement with DAF on combining applications for major waterways • Strategy for ADR compliant crossings installed when timeframes for use are exceeded, or crossings are proposed to be used by the landholder long term (particularly if the crossing was an upgrade of a previously unlawful structure) • Rehabilitation strategy to ensure no long term impediment to operational maintenance and hydraulic characteristics.		
18.2.5	A Dewatering Plan must be developed by the Contractor. Prior to dewatering, investigation must be undertaken to identify nearest sensitive receptors to ensure the suitability of dewatering. The following general requirements apply: a) Once approved by the landholder, access tracks to be installed in accordance with relevant technical specification requirements. b) Minimise ground disturbance and soil disturbance in erosion prone and steeply sloping areas during clearing activities. Determine appropriate clearing methods for moderate to high erosion prone and steep areas so that the clearing methods minimise soil disturbance and potential for soil loss. c) A dewatering method is to be prepared and implemented, taking into consideration site conditions. At a minimum – Dewatering of foundations or pits shall be dewatered through a filtration mechanism (i.e., sediment filtration device) with nil sediment discharge off site. Dewatering records are mandatory for sediment basin management. Records of dewatering of a sediment basin must contain the type and quantity of flocculating agent applied, pH of water immediately prior to release, turbidity (NTU) of water immediately prior to release, volume of water released, location of release, date, and time, and will be available on site for inspection. D) Ensure that any excavation or placing fill in a waterway is carried out in accordance with the Riverine Protection Permit Exemption Requirements (WSS/2013/726) or is otherwise authorised under relevant legislation. e) Any areas required for stockpiling must have topsoil stripped (100 mm depth) prior to placement of any stockpile material to ensure suitable material is available for rehabilitation.	The JV Environment Manager	

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
18.2.6	Personnel undertaking treatment or testing activities will be made aware of accountabilities of the Dewatering Procedure and suitably trained to undertake testing and treatment.	The JV Superintendent The JV Environment Manager	
18.2.7	Planning will occur to identify exclusions / restricted areas for the following aspects in relation to waterbodies. These exclusions / restricted areas will be documented within Site Environmental Plan: • Location of Hazardous substances storages • Location and size and stabilisation of stockpiling activities including mulches • Weed treatment: herbicide / treatment type and applications with regard to sensitive environments including waterways.	The JV Environment Manager	
Construction			
18.2.8	Surface and ground waters will not be extracted (for construction use, or pumping / dewatering) without prior approvals / permits being in place, or as in line with legislated dusts. Specifically in accordance with "OSW/2020/5467 Exemption requirements for constructing authorities for the take of water without a water entitlement" (Version 4.01, dated 05/02/2021). Where the JV activities will result in exceeding private landowner groundwater allocations, permits will be obtained to enhance this allocation, if possible, else extraction must comply with pre-existing allocations. Water shall only be taken from points authorised by the Client in accordance with exemption notification requirements.	The JV Project Director The JV Environment Manager	CoG Report Appendix 4 – Commitment 4 Water Act 2000 exemption guidelines for constructing authorities
18.2.9	Where groundwater is encountered during excavation or piling activities, it will be captured and tested prior to discharge. If groundwater does not meet water quality parameters, it will be disposed of at an appropriately licensed facility/treated onsite.	The JV Superintendent Environment Manager	
18.2.10	The JV will prioritise the use of captured surface waters for construction purposes as opposed to discharging to receiving environment and using potable water sources.	The JV Superintendent The JV Environment Manager	
18.2.11	An adequate number of concrete washout facilities must be installed and maintained. The concrete washout to be conducted in designated areas only, with concrete drivers advised of its location. The washouts will be isolated from surface water flows using bunds to prevent contamination of clean surface waters and will be lined to prevent contamination of groundwater.	The JV Supervisor	
18.2.12	Water quality management will include (as addressed in	The JV	CEMP Sub Plans

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	separate Sub Plans): • ESC measures (refer to Sub Plan 18.1) • Plant and equipment hygiene, pre-start, refuelling maintenance controls (refer to Sub Plan 18.9) • Hazardous substance bunding (refer to Sub Plan 18.9) • Waste minimisation, storage and housekeeping (refer to Sub Plan 18.10).	Supervisor/PM/EA	
18.2.13	All dewatering will be done in a controlled manner in accordance with the Dewatering Procedure (and Permit). All water leaving site will be clean and free of contaminants. Quality of all water will be tested and recorded prior to discharging from site. At a minimum pH, Turbidity, volume of water, location of water and time of water release will be recorded.	The JV Supervisor Environmental Advisor	Dewatering Procedure
18.2.14	Excavations or placing of fill within watercourses will occur under provision of a Riverine Protection Permit where required and comply with conditions of the approval, excepting where works comply with “Riverine protection permit exemption requirements” (WSS/2013/726, Version 2.03 dated 2/06/2023).	The JV Supervisor	Riverine Protection Permit Or exemption guideline requirements
18.2.15	Water crossings which require constructing or upgrading will be undertaken in accordance with DAF Accepted Development Requirements for Operational Work that is Constructing or Raising Waterway Barrier Works (ADR requirements). This includes: • Standard conditions • Pre and post works notifications to DAF.	The JV Supervisor	DAF Guideline
18.2.16	The use of herbicides and growth retardants, as well as retardants and insecticides over and adjacent to dams, drainage lines and waterways will be restricted to reduce contaminated runoff entering the receiving environment. Note no use of these will be permitted for weed treatment on organic farms as per landholder requirements. Stockpiles and laydowns will be located away from wetlands, waterways and drainage lines (constructed in addition to design).	The JV Supervisor	WQP CoG Report – Appendix 4 Commitment 74
18.2.17	The quantity of water consumed on the Project from each of the following sources will be reported monthly: • Potable water • Water obtained under an extraction licence or other regulatory authority • Recycled water sourced outside the Project. The quantity of water will be tracked over time to determine the project’s water trends. As part of six monthly reviews, evaluate trends and identify any opportunities for minimisation of potable water consumption.	The JV Project/Site Engineers The JV Supervisor The JV EA	Environmentally Sustainable Development

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	Water minimisation initiatives assessed as feasible are to be implemented under a management of change process.		

18.3 Biosecurity Management

Environmental Management Sub Plan: Biosecurity Management Plan	
Environment Objectives	• No introduction, release, movement or transportation of biosecurity matters onto the Clients Site, as a result of construction activities.
Performance Criteria	• No introduction of flora, fauna, and/or organisms that may impact on the native ecosystem • No movement/transportation of flora, fauna, and/or organisms that may impact on endemic environment • Implement treatment methods for weed and pests found.
Legislation	• *Environment Protection and Biodiversity Conservation Act 1999* • *Biosecurity Act 2014*
Approvals	• As per Appendix D 'Regulatory Approvals Plan'
Monitoring	• Weekly environmental inspections for weed presence and spread (GIS data available to map changes in field) • A targeted weed and pest biosecurity survey will be undertaken within 6 months of commencing each section of works • Post wet season weed and pest survey in all disturbed areas • Clean down locations will be regularly monitored for weeds and marked on site • Competence of workers in washdown activities by trained persons.
Reporting	• Findings of weekly inspections will be reported • Presence of restricted matter will be reported to the Regulator • An increasing intensity and spread of weeds will be managed as an incident.
Corrective Actions	Depending on the nature of the incident corrective actions may include but not limited to: • Additional education and awareness programs • Re-fresher training on plant and equipment clean down procedures • Targeted weed treatment programs in consultation with landholders where there is an existing impacted seedbank and adjacent sources • Creating exclusion areas; or • Auditing washdown bay use. As per requirements of the separable aspect specific Sub Plan.

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
Pre-construction			
18.3.1	Prepare a Biosecurity Management Plan (BMP). This Plan must identify: • Landholder specific biosecurity requirements/alignment with existing property Biosecurity Management Plans • Management of biosecurity risks is to be in compliance with land access requirements in Environmental Work Plans (EWPs) and Land Access Permits (LAPs) • If vehicles, plant, equipment, and machinery leave the Project area, they must be re-certified using a new Biosecurity Certificate document when arriving back within the project area • Mapping of all surveyed weed locations (noting this will be based on the Client led pre-clearance ecology survey findings) • Preferred weed treatment methods for local, State and Federal requirements for known weeds of national	The JV Environment Manager	CoG Report, Appendix 2 Part B, Condition 20

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	significance, restricted, invasive or regionally declared weeds • Identification of high risk plant and equipment, and materials and specific hygiene controls • Clean down sites will be located as close as possible to the infested area to prevent further weed and pathogen spread • Measures during construction to prevent weed spread • Feral animal management (prepared in consultation with stakeholders as appropriate and with consideration to the temporary nature of construction works) • Monitoring during construction to identify and treat weed emergence • Notification requirements for any Stakeholders when undertaking ongoing treatment • Weed awareness methods. A copy of this MP must be submitted to DSDILGP 2 months in advance of works.		
18.3.2	The presence, extent and characteristics of invasive flora and fauna will be determined (to inform the BMP) concurrent with rapid fauna surveys.	The JV Environment Manager	Legislative requirements UGLMS-131-544 UGLMS-131-391
18.3.3	Prior to construction, weeds will be treated in accordance with the BMP, subject to land access requirements and seasonality constraints. Note, weed management may require access 2-3 months in advance of works to ensure any chemical treatment has time to take effect and that during clearing no live weed material is encountered. Treatment records will be maintained. Treatment will be undertaken, if using chemicals, with a person suitably licenced to do so.	The JV Construction Manager	BMP UGLMS-131-544 UGLMS-131-391 UGLMS-4-1321
18.3.4	All works to be in accordance with the PQ Land Access Protocol • Where practicable, existing approved access tracks will be used for the Project in preference to creating new tracks, with upgrading or extension conducted for the requirements of this Project • Reinstatement will be undertaken progressively during construction, where practicable, and the Contractor will ensure that all disturbed areas impacted from construction are reinstated at the end of the Project • Geotechnical assessments may be undertaken prior to construction to determine the appropriate foundation type for each structure and the substations • Where appropriate, replacement infrastructure will be provided where necessary (new fences and gates, culverts or signage) to mitigate impacts on access and infrastructure to the properties • Implementation of biosecurity measures under the Land access protocol.	The JV Construction Manager	HSE Specification
18.3.5	Once approved by landowners, established roads and tracks will be utilised where practicable, with slashing and gravelling to be considered in areas of high-volume traffic.	The JV Construction Manager	HSE Specification

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	Ground disturbance and removal of native or pastoral ground cover is kept to a minimum.		
18.3.6	All plant and equipment on the site will be washed down prior to arriving on site, with a declaration stipulating that the plant and equipment is clean by a third party to avoid the assertion any new weeds have been introduced into the region by the project. Any hire vehicle required for work where biosecurity management is an issue, shall be accompanied with a current Biosecurity Hygiene Declaration document at the nominated vehicle collection date and time. A visual inspection shall be undertaken on the hire vehicle to ensure biosecurity hygiene requirements.	The JV Logistics Manager	
18.3.7	Clean down sites must be clearly marked in the field and scheduled for weed monitoring. Clean down sites will be recorded in the Powerlink GIS system.	The JV Supervisor	HSE Specification
Construction			
18.3.8	All plant and equipment on site will be washed down at designated washdown bays (as per the BMP) when moving between properties, between clean and dirty zones on a single property and prior to leaving site (if entering a new property or at the accommodation hub wheel wash). Temporary and permanent clean down facilities will follow the preferential order of: 1. utilise existing commercial clean down facilities 2. on PQ owned land 3. on easement 4. on road reserve 5. on existing and agreed access. Ground disturbance and removal of native or pastoral ground cover is kept to a minimum. Once the topsoil has been stripped from an access track, this is considered a clean zone for vehicle movement (subject to no movement off-track) except where a designated washdown bay has been installed for use and required by the landholder under agreement/LAP requirement. Clean down sites will not be located in environmentally sensitive areas (as defined by the Environmental Protection Act 1994), unless agreed to by the nominated Regulator (e.g. a temporary clean down facility in a National Park).	The JV Supervisor	Legislative requirements UGLMS-131-544 UGLMS-131-391 Landholder agreements LAPs
18.3.9	All persons trained in hygiene requirements for plant and equipment will be allocated a dedicated (unique identifier) Biosecurity Hygiene Books for their own use. The Contractor shall ensure that personnel required to self-certify or certify other vehicles, plant, equipment and machinery using statutory declarations or other formal certification systems, have the appropriate qualification/ competency (e.g. AHCBIO201 or equivalent) to inspect and clean machinery for plant, animal and soil material. Triplicate copies (with unique identifier and number within) will be used by the Project as follows: • Part 1 to be kept with the vehicle, plant or equipment at all times (and must be made available on request)	The JV Environmental Manager	UGLMS-4-1322 UGLMS-4-1323 *Land Environment Approvals Cultural Heritage Framework*

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	• Part 2 copy to be left at the landholder specific washdown bay/property access box/provided to the relevant Land Agent • Final copy will be retained in the book and the book returned once used. A Weed Hygiene and Materials Register will include a book tracking system to track distributed books for their return for retained records.		
18.3.10	Weed hygiene management measures on site may require 'dirty' plant (working in a weed management zone) to be washed before movement within the road corridor/cross property boundary. These requirements will be mapped and displayed in prominent areas, together with targeted and whole of Project communications of the requirements. At each of these washdown locations, a temporary washdown bay will be installed and maintained, with records kept of washdown. Where temporary washdown treatment areas are established, care will be taken to ensure that they are located greater than 30m from a watercourse, drainage line or environmentally sensitive area; designed to contain weed seeds, sediments and to prevent vehicle recontamination.	The JV Superintendent	BMP
18.3.11	Wherever possible, topsoils will be re-used for rehabilitation in the area it was sourced from to reduce the spread / dispersion of weeds to other areas. During the construction period, topsoil stockpiles will be managed for weed regeneration in order to deplete the existing weed seedbank where feasible.	The JV Supervisor EA	BMP
18.3.12	10 days prior to works scheduled, a pre-clearance verification survey focused on weeds, as part of the rapid fauna survey will be undertaken to inform work pack requirements. Where an infestation has been identified (will also include observations from ongoing targeted weed surveys within 6 months and post wet season), the area will be excluded until appropriate treatment has occurred in accordance with the project's biosecurity plan requirements specific to that weed and risk-based nature of the works.	The JV Supervisor	BMP
18.3.13	When accessing construction sites, the JV and subcontractors will use only approved access tracks/roads.	The JV Supervisor	Land Access requirements
18.3.14	Ongoing spot/area weed treatment using chemicals will be by site individuals who are sufficiently trained in the use of such chemicals (ie. ACDC Licence). Record of all chemical treatments will be maintained. Notification of use of chemicals with Stakeholders will be in accordance with the BMP requirements.	The JV Supervisor/EA	UGLMS-131-544 UGLMS-131-391 UGLMS-4-1321
18.3.15	All soils or mulch materials brought to the project site must be certified (including documentation) by the supplier as weed-free. Vehicles transporting material that may contain biosecurity matter will be covered. Biosecurity Instrument permits (Biodiversity certificates) inspect work area associated with the material brought onto the project are to be provided from suppliers of products from identified areas under the Biosecurity Act 2014.	The JV Supervisor	Legislative requirements

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
18.3.16	A project specific significant biosecurity identification guide will be developed and be provided to project personal and promoted as required at toolbox/prestart meetings. All personnel will maintain a copy of this guide in their transport and in environmental WorkPacks.	The JV Supervisor/EA	CopperString 2032 EIS
18.3.17	Clean down facility material that contains contaminated biosecurity matter shall be disposed of as regulated waste or. In accordance with Biosecurity Act 2014 requirements.	The JV Supervisor/ PM/EA	CopperString 2032 EIS
18.3.18	At a minimum, vehicles will be subject to a clean down every six weeks regardless of vehicle movements across the project. This is only applicable for light vehicles, crew trucks, service vehicles, transport trucks and any other vehicle which regularly traverse between different project weed zones.	All project drivers	CopperString 2032 EIS
18.3.19	All personnel, vehicles, plant, equipment and machinery to be cleaned and disinfected of pathogens upon exiting known pathogen risk areas (e.g. Panama disease tropical race 4 – fungus).		
18.3.20	Topsoil contaminated with biosecurity matter or large stockpiles of biosecurity matter will be stored separate to clean topsoil/vegetation piles and clearly signed to avoid mixing with clean areas.	The JV Supervisor	CopperString 2032 EIS
18.3.21	Where required, vermin and pest control will take place around accommodation and camps.	The JV PM	CopperString 2032 EIS
18.3.22	Clean down facilities are to be constructed in accordance with Powerlink requirements. Agreement from the landholder for single temporary or “one off” installations (if required) shall be selected at the edge, or nearby to any areas where weeds or pathogens need to be contained; ensure runoff will not enter any watercourse or waterbody; avoid sensitive vegetation and select locations which gently drain away from the clean down location. Clean down facilities are to be clearly marked in the field for weed monitoring	The JV PM	HSE Specification
18.3.23	Temporary clean down facilities (washdown bay/wheel wash as otherwise known) will meet the following design criteria: • For temporary mobile wash facilities on easement these must be a bunded area with treated discharge system, gurney operated with generator power and be manned to maintain cleanliness and pump out as required • For temporary wash facilities within accommodation hubs these will be designed with a 5 year design life and will involve, or meet an equivalent design outcome of: ○ Bunding and side/enclosed walls to prevent overspray ○ Balance tank and recycled water tank as a closed system ○ Collection sump with float operated pump to avoid overflows ○ Silt sump for capture of waste and collection ○ Sand filter for treatment of wastewater to recycle ○ Vertical gravity separator with waste container and sludge tank accessible for collection and clean outs	The JV PM	Best practice & HSE Specification

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	○ Contingency power supply • Clean down sites will be located as close as possible to the infested area to prevent further weed and pathogen spread.		
18.3.24	Temporary clean down facilities will be decommissioned at the end of the project/when not required and area progressively rehabilitated. Powerlink will monitor current and previous clean down sites for a minimum of 2 cycles after the site was last used. Temporary clean down sites will be decommissioned at the end of the project. Any contaminated materials disposal facility and the site rehabilitated in accordance with the rehabilitation management plan	The JV PM	CopperString 2032 EIS
18.3.25	Where it has been categorically established that the introduction or spread of biosecurity matter has been caused by the Contractor's activities, the Contractor is responsible for undertaking any necessary treatment to eradicate the biosecurity matter to the satisfaction of Powerlink.	The JV PM	HSE Specification
18.3.26	Report to the Powerlink Contract Manager without delay: (i) Any known or suspected Prohibited Matter or Category 1 or 2 Restricted Matter; and (ii) Any biosecurity event or other notifiable incident.	The JV PM	HSE Specification
18.3.27	Undertake clean downs as per the Queensland Government Inspection and Clean Down Procedures.	The JV PM	HSE Specification
18.3.28	Vehicle journey planning shall be undertaken, as far as practicable, in order to visit biosecurity free areas first, before travelling to areas affected by biosecurity matters.	The JV Supervisor	HSE Specification
18.3.29	Avoid or minimise travel through areas heavily affected by biosecurity matters wherever possible. If areas containing biosecurity matters (that are of high risk of spreading) are traversed, a clean down is to be completed upon leaving the area and subsequent record completed, based on the biosecurity risk assessment outcome.	The JV PM	HSE Specification
18.3.30	Once approved by landowners, established roads and tracks will be utilised where practicable, with slashing and gravelling to be considered in areas of high volume traffic	The JV PM	HSE Specification
18.3.31	Biosecurity Certificates shall be provided for all high risk material (i.e. sand, soil, mulch etc.), from suppliers of these products (if available). Quantities of soil/gravel obtained from a land holders borrow pit shall have a self-certifying Biosecurity Certificate (excluding movement of material within the same property).	The JV PM	HSE Specification
18.3.32	Participate as required in the Queensland Government Biosecurity requirements for managing emergency situations.	The JV PM	HSE Specification
18.3.33	Inspect work areas for new outbreaks as required.	The JV PM	HSE Specification
18.3.34	Powerlink will monitor current and previous clean down sites for a minimum of 2 cycles after the site was last used.	The JV PM	HSE Specification
18.3.35	Biosecurity data (weed species and distribution) to be collected commensurate with the level of risk.	The JV PM	HSE Specification
18.3.36	Appropriate disposal of material potentially contaminated with pest plant materials and diseases in accordance with Biosecurity Act 2014 requirements.	The JV PM	HSE Specification

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
18.3.37	Clean down sites will not be located on a clean property (with the exception of a Powerlink owned property), but rather on the way out of a property affected by a biosecurity matter.	The JV PM	HSE Specification
18.3.38	Clean down sites will not be located on a clean property (with the exception of a Powerlink owned property), but rather on the way out of a property affected by a biosecurity matter.	The JV PM	HSE Specification
18.3.39	Clean down sites will not be located in environmentally sensitive areas (as defined by the Environmental Protection Act 1994), unless agreed to by the nominated Regulator (e.g. a temporary clean down facility in a National Park).	The JV PM	HSE Specification
18.3.40	Clean down sites will be located as close as possible to the infested area to prevent further weed and pathogen spread.	The JV PM	HSE Specification
18.3.41	Runoff will be managed to ensure that sediment, grease, oil and viable plant material does not pollute waterways. Clean down equipment shall be maintained in a serviceable and usable condition.	The JV PM	HSE Specification
18.3.42	Clean down site locations will be provided to Powerlink and recorded in the Powerlink GIS system.	The JV PM	HSE Specification
18.3.43	Temporary clean down sites will be decommissioned at the end of the project, with geo-fabric and contaminated materials disposal facility and the site rehabilitated to meet 70% ground cover	The JV PM	HSE Specification
18.3.44	Distribution in a hazardous area is carried out in accordance with a Hazardous Area Distribution Permit and the prescribed conditions for the hazardous area. Refer to the Agricultural Chemicals Distribution Control Act 1966 for more information.	The JV PM	HSE Specification
18.3.45	Liaise with and notify landholders prior to the use of chemicals (to control weeds) on properties.	The JV PM	HSE Specification
18.3.46	All methods and rates of chemical application must comply with label conditions (or a permit for off label use). Refer to the Australian Pesticides and Veterinary Medicines Authority for more information.	The JV Supervisor	HSE Specification
18.3.47	Careful consideration must be given to weather conditions before commencing ground distribution. As a minimum, wind direction, wind speed, temperature, relative humidity and predicted forecast must be checked by the worker responsible for the distribution activity to determine if f weather is suitable for ground distribution of chemicals.	The JV Supervisor	HSE Specification
18.3.48	Make and keep records for each and every ground distribution of chemicals in accordance with section 26 of the Agricultural Chemicals Distribution Control Act 1966. Submit records to Powerlink at the completion of works under contract. Keep records for a period of 2 years after such distribution.	The JV Supervisor	HSE Specification
18.3.49	Report any damage to stock as a result of chemical distribution to Powerlink within 2 days.	The JV Supervisor	HSE Specification
18.3.50	Report any damage to crops as a result of chemical distribution to Powerlink within 14 days.	The JV Supervisor	HSE Specification

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
18.3.51	All waste products and hazardous substances with the potential to cause contamination must be appropriately stored and managed to prevent an accidental release of contaminants to the environment.	The JV Supervisor & Project Manger	HSE Specification

18.4 Flora & Vegetation Management

Environmental Management Sub Plan: Flora and Fauna Management Plan	
Environment Objectives	• Avoid or minimise impacts from Project activities to terrestrial and aquatic flora • (and fauna habitat) and ecological communities • Minimise footprint of vegetation clearance.
Performance criteria	• Clearing extent is minimised throughout Design wherever possible and is limited to that only required for construction activities • No regulatory incidents relating to clearing outside of allowed limits and/or clearing without approvals / permits in place.
Legislation	• *Environment Protection and Biodiversity Conservation Act 1999* • *Environmental Protection Act 1994* (+ regulations) • *Nature Conservation Act 1992* (+ regulations) • *Vegetation Management Act 1999* • *Stock Route Management Regulation 2003*
Approvals	• As per Appendix D 'Regulatory Approvals Plan'
Monitoring	(Dependent on rapid fauna surveys) • Weekly environmental inspections for retained vegetation condition, clearing extents (based on survey data) • Daily inspections to confirm location specific clearing method is being undertaken • EWMS have been reviewed and acknowledged by all workers • FSC monitoring during clearing (refer to Flora and Fauna Management Plan).
Reporting	• Findings of inspections and targeted audits will be reported • Unauthorised clearing will be reported to the Regulator.
Corrective Actions	Dependent on the nature of the finding, incident or non-conformance, corrective actions may include (but not limited to): • Additional education and awareness programs • Review/update of the EWMS • Environmental/ecological supervision during clearing (additional to FSC resources) • Additional site controls for clearing zones.

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
Pre-construction			
18.4.1	Design of the permanent and temporary infrastructure will be subject to environmental constraints assessment, refer to Section 7 of this CEMP.	Design Manager JV Environmental Manager	CoG Report Appendices 2-5
18.4.2	In order to: • Inform design and minimise impact to vegetation • Determine location specific clearing methods (eg. Bulldozer vs more refined hand or mechanical clearing in ESAs) • Validate mapped extents of conservation significant fauna habitat (confirm MNES) and determine any change requirements to maximum disturbance limits to habitat for listed threatened fauna species • Confirm presence of individual occurrences of threatened flora species	JV Environmental Manager	CoG Report, Appendix 3, Condition 2 CoG Report Appendix 4 Commitment 14 EPBC 2019-8416

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	• Inform construction monitoring requirements • Confirm offset provisions. Pre-clearance fauna surveys will be undertaken at least 6 months prior to each stage of construction by the Client and provided to the JV for micro-siting assessments of linear and non-linear infrastructure. Pre-clearance surveys will be undertaken at all design footprints including temporary construction areas outside the corridor ancillary to the development (addressed by the MID application). Pre-clearance surveys will be undertaken by suitably qualified ecologists for listed threatened species identified in Condition 1 of the CoG Report (Appendix 3) with data equipment suitable for up to 0.2m GPS accuracy. Once completed, within 10 business days, pre-clearance surveys will be submitted to the Department (Client Obligation). These surveys will support management of clearing to mitigate impacts on flora and fauna on the project and identify the need for further approval of additional mitigation or management procedures or processes (i.e. Species management Program (under QLD legislation). All permits for the approval of clearing will be obtained prior to any clearing progressing. These permits and approvals will be complied with.		Conditions 8-12
18.4.3	During the design phase post pre-clearance surveys, GIS layers will be developed showing the full extent of clearing of different layers of habitat. This will include but not limited: • Canopy layer • Lower-level vegetation (shrubs etc.) • Layer of low impact clearing (slashing or grading of grass) This will allow the project to calculate and report on the estimated value of habitat required to be cleared for significant fauna species located within the project.	The JV Environmental Manager	CoG Report Appendix 3 Condition 2
18.4.4	A GIS evaluation by the Client will be undertaken using mapped data, used in the assessment of maximum disturbance limits for listed threatened fauna species, to reconcile any difference between mapped and field verified habitat for each of the listed threatened fauna species: • Koala • Squatter Pigeon (breeding and foraging habitat) • Southern Black-throated Finch (breeding and foraging habitat) • Night Parrot (breeding and foraging habitat) • Australian Painted Snipe • Painted Honeyeater • Julia Creek Dunnart • Red Goshawk • Ornamental Snake • Plains Death Adder. For any differences, a report will be submitted to the Department for an amendment request/consultation. The JV will map the actual clearances and maintain a drawdown register against the maximum disturbance to verify compliance with clearing limits.	The JV Environment Manager	CoG Report Appendix 3 Condition 2

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
18.4.5	Suitably qualified ecology specialists will support the application of any secondary vegetation approvals prior to disturbance as per the findings of the relevant Environmental Constraints Assessment.	The JV Environment Manager	HSE Specification
18.4.6	Based on pre-clearance surveys and progressive design, a MNES Threatened Species Management Plan will be prepared for 3 listed flora species as per below and 10 list fauna species as per above: • Black ironbox • Pink gidgee • Waxy cabbage palm. The MNES Threatened Species Management Plan must address minimum mitigation measures identified in the CoG Report for the following species: • Koala • Squatter pigeon • Night Parrot • Black-Throated Finch. This MNES Threatened Species Management Plan will be submitted for approval 3 months in advance of construction commencing to the Department (excludes early works scope).	The JV Environment Manager	CoG Report, Appendix 3, Condition 5 CoG Report Appendix 4 – Commitment 56 EPBC 2019-8416 Conditions 13-17
18.4.7	Review the project's existing Bushfire Management Plan to confirm if any changes are required based on the: • CoG Report • Pre-clearance surveys • Climate change risk assessment • Stakeholder consultation • Detailed design. The final Bushfire Management Plan will be reviewed and approved by a person suitably qualified in bushfire management.	The JV Project Director	CoG Report Appendix 2, Part B, Condition 25 CoG Report Appendix 4 Commitment 140
Construction			
18.4.8	No disturbance will proceed without an approved: • MNES Threatened Species Management Plan • Species Management Program • Secondary approvals where required • An approved Site Environment Plan (i.e. and Environmental Work Plan) detailing sensitive areas, clearing and delineation.	The JV Project Director	Legal requirements
18.4.9	All plant and equipment involved in clearing activities musts be fitted with GIS with vegetation boundaries clearly marked and alarm system installed for the GIS to operate as intended. In the event of an alarm indicating exceedance, works are to cease and internal reporting to the JV Environment Manager undertaken. Workers will be made aware of vegetation management requirements in induction training, EWPs and through work instructions. The JV supervisor will have available an approved Site Environment Plan (i.e. and Environmental Work Plan) which has been toolboxed with the clearing team prior to commencement of any clearing. This will delineate no-go zones, areas to be retained and clearing to be undertaken. This will be kept on site with the supervisor as part of the work pack. In addition, where there is thick vegetation making visual pegging difficult to see, the following controls are proposed:	The JV Supervisor	UGLMS-131-389 Best practice

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	• Pegs suitably spaced in line of site and fitted with orange conduit up to 2m in height • Surveyor present with each dozer/excavator with survey equipment. The extent of clearing (work area) shall be clearly marked on site using high visibility barriers or taping to ensure that clearing shall not occur in areas to be preserved. The marked up limits of clearing shall be maintained for at least the duration of clearing and earthworks.		
18.4.10	Prior to commencing clearing, assess all proposed vegetation clearing to determine if any approvals or permits are required, including for native vegetation, Endangered, Vulnerable and Near Threatened (EVNT) plants, and species and ecosystems listed under the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC) and Nature Conservation Act 1992 (NC Act). Assessment is to be undertaken by a suitably qualified person. Do not clear or cause damage to vegetation prior to assessing its significance and applicable approval requirements.	JV Ecologist and JV Environment Manager	HSE Specification
18.4.11	Assessment, disturbance or clearing of any habitat features (i.e. trees containing hollows, hollow logs, nests, other breeding places) will require a suitably qualified and experienced person (as defined by DES – e.g. Rehabilitation Permit) for any relocations. Clearing is to be undertaken in a staged and sequential manner, away from harmful environments such as roads.	JV Ecologist	HSE Specification
18.4.11	Prior to any disturbance, clearing or grubbing activities in any location the following must be in place: • The JV Permit to Disturb (includes the pre-clearing checklist completed) • Any other required approvals • No-Go Zones for significant flora habitat must be established, fenced/ flagged and sign posted. Note under biosecurity requirements, weed treatment would have been completed. The Permit to Disturb will identify: • Clearing methodology • 2-staged clearing process for management of Hollow/Habitat Bearing Trees (HBTs) • Inspection requirements • Fauna work pack requirements. To inform the Permit to Disturb requirements, pre-clearance verification surveys will be undertaken up to 10 days from scheduled works, aligned with rapid fauna assessments, to confirm pre-clearance ecology surveys undertaken more than 6 months prior as per conditions of approval in order to assess any change to environmental conditions, specifically weeds.	The JV Supervisor	Permit to Disturb
18.4.12	All efforts will be made to retain HBTs in situ where they do not interfere with safe construction and operation. Depending on the condition and advice from the FSC, habitat features will be excised and stockpiled separately for reinstatement/fauna recovery.	The JV Supervisor/EA	Best practice
18.4.12	When accessing construction sites, the JV workforce and subcontractors will only use approved access tracks/roads. Infield, these will be signed, and route available on the GIS platform.	The JV Supervisor	Site plans

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	Impacts on stock routes from construction traffic and crossings will be minimised by addressing soil management, biosecurity and waste.		
18.4.13	Trees to be permanently retained will be clearly marked in a 2 staged clearing process, as different from HBTs. Tree protection zones (TPZ = 12xDBH) will be delineated by markers, construction tape webbing or other barriers. No vegetation will be stockpiled up against retained vegetation (or obstruct low flow paths or be located in waterways). No equipment, plant, vehicle and materials shall be stored within the drip line of a tree.	The JV Supervisor/EA	UGLMS-131-389
18.4.14	Clearing will be conducted in a staged approach as much as practicable to reduce the amount of ground that is exposed at any one time. Clearing will be undertaken in accordance with the agreed method determined in design and detailed in the Permit to Disturb. No burning for vegetation is to be completed on site.	The JV Supervisor	CESCP Works Scheduling Permits
18.4.15	Cleared/ removed vegetation shall be beneficially reused where practicable for erosion and sediment control or reinstatement. Dispose of felled timber in consultation with the landowner and occupier. Vegetation is not to be placed where it may increase any fire hazard and impact on the Powerlink Assets in the event of a fire. Where possible, timber of commercial value will be managed separately.	The JV Supervisor	P-CESCP RMMP UGLMS-131-389 CoG Report – Appendix 4 Commitment 15
18.4.16	A project specific significant flora (including breeding and foraging habitat characteristics of threatened fauna species) identification guide will be developed and be provided to project personnel and promoted as required at toolbox/prestart meetings.	The JV Supervisor/EA	CopperString 2032 EIS
18.4.17	Any unauthorised disturbance to vegetation shall be entered into Synergy as an Incident, and the relevant reporting process for the Client initiated.	The JV Supervisor/PM/EA	UGLMS-131-389
18.4.18	Powerlink will provide guidance on no-go zones, sensitive vegetation and habitat (such as identified nests) areas to be cleared and retained, methods for clearing and other relevant environmental protection matters. These will be captured on Site Environment Plans	JV Environment Manager	HSE Specification
18.4.19	Obtain a project specific approved Species Management Program (SMP) from DES for tampering with animal breeding places “low risk of impacts” for Least Concern animals (excluding Special Least Concern or colonial breeders).	JV Environment Manager	HSE Specification
18.4.20	Dispose of felled timber in consultation with the landowner and occupier. Vegetation residues should not impact on downstream water flow or quality or the easement land use. Vegetation is not to be placed where it may increase any fire hazard and impact on the Powerlink Assets in the event of a fire.	The JV Supervisor/PM/EA	HSE Specification
Post Construction			
18.4.20	Clearing Reports will be provided based on approved Species Management Plan/s, approvals/ permits requirements following clearing in each stage / area. The clearing report must include information such as: • Dates when clearing occurred	The JV Environmental Manager	Permit to Disturb

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	• A plan showing areas cleared relative to the plan of clearing limits including completion of the post-clearing checklist • FSC records • Drawdown Register updates. GIS files of as built permanent data will be provided to DSDILGP following construction.		

18.5 Fauna Management

Environmental Management Sub Plan: Flora and Fauna Management Plan	
Environment Objectives	• Minimise the temporary and permanent reduction of fragmentation of existing fauna colonies • Ensure the safe capture and release of fauna around the project.
Performance Criteria	• No mortality of listed fauna of conservation significance on site.
Legislation	• *Environment Protection and Biodiversity Conservation Act 1999* • *Environmental Protection Act 1994* (+ regulations) • *Nature Conservation Act 1992* • *Nature Conversation (Wildlife Management) Regulation 2006*
Approvals	• As per Appendix D 'Regulatory Approvals Plan'
Monitoring	• FSC monitoring during clearing activities. Live data capture preferred • Weekly environmental inspections for fauna approval conditions • Fauna records weekly to determine threatened species hot spots for evaluation of control effectiveness/additional requirements • Targeted species monitoring as per rehabilitation monitoring requirements.
Reporting	• Fauna deaths to be reported to the Environment Team • Spotter catcher wildlife records as per Rehabilitation Permit • Animal Breeding Place register submitted as per NC Act requirements.
Corrective Actions	Dependent on the nature of the finding, incident or non-conformance, corrective actions may include (but not limited to): • Additional FSC resources • Ad hoc changes in clearing methodology based on risk supported by evidence • Education and awareness campaigns As per requirements of the separable aspect specific Sub Plans.

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
Pre-Construction			
18.5.1	Post pre-clearance surveys, prepare a Threatened Species Management Plan (SMP) for State listed fauna to support an application for a high risk "Species Management Program". This Threatened Species Management Plan (refer to Section 18.4 for this separate requirement) can be combined with Commonwealth listed species (particularly where dually listed) and include the purple-necked rock wallaby. The SMP must identify construction mitigation measures to reduce the impact to foraging and feeding sites. This may include: • Additional disturbance restrictions/avoidance of habitat during design • Specific clearing methods • Measures to limit construction activities to avoid breeding seasons of threatened species • Where required, measures to relocate individuals identified during pre-clearance surveys by qualified and experienced fauna spotter-catchers, install	The JV Environment Manager	CoG Report, Appendix 2, Part B, Condition 18 CoG Report Appendix 4 – Commitment 56

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	fauna exclusion fencing and enforce speed limits onsite • Other as determined by a suitably qualified and experience Ecologist preparing the SMP. This SMP application must be decided prior to clearing any works.		
18.5.2	The Contractor must avoid and where not practicable mitigate and minimise any impacts to koala and koala habitat by: a) No vegetation is to be removed unless formally approved under the relevant environmental legislation and or exemptions b) Remove the minimum number of trees required, to the extent practicable and to maintain safe and reliable operation of the asset in accordance with Powerlink Standard c) Retain medium sized understory native species (Grevillea, Acacia, Denhamia, Atalaya, Gardenia & Melaleuca), consistent with the safe and reliable operation of the asset d) Sequential clearing (or staged clearing) of vegetation to provide sufficient time and space to allow any koala residing in a tree to move to alternative habitat (on its own accord) without harm. Ensure not more than the following is cleared in any one stage: (i) For a clearing site with an area of 6 ha or less – 50 % of the site's area (ii) For a clearing site with an area of more than 6 ha – 3 ha or 3 % of the site's area, whichever is the greater e) The direction of sequential clearing should, where possible be away from threatening processes or hostile environments and towards any retained vegetation or habitat links, ensuring: (i) Koalas are not pressured through loss of habitat, to crossroads or move through developed or disturbed areas (ii) Koalas are not left occupying an 'island' of habitat between hostile environments, such as a road and cleared area (iii) Koalas can safely leave the site of clearing and relocate to adjacent habitat f) If an individual is found prior to or during clearing activities, it must not be forcibly relocated. Any tree that has a koala present, as well as any tree with its crown overlapping that tree, must not be removed and remain in place until the koala vacates the tree of its own accord g) Commission a suitably qualified and/or experienced spotter catcher or ecologist to provide advice and recommendations for koala habitat and koala management where impacts on koala or non-juvenile koala habitat trees have been identified as potentially significant h) Known koala habitat to be located in Powerlink GIS system and temporary or permanent 'no go zones' are to be clearly signposted and delineated (using visible	The JV Environment Manager, The JV Supervisor,	HSE Specification

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	marking tape or the like) to ensure that there is no unauthorised clearing or damage of koala habitat i) Safeguard koalas from dangerous equipment and works using koala exclusion fencing j) New clearing plans are to be prepared showing the proposed extent of clearing required prior to the commencement of site works k) Where possible, preferentially utilise a fella-buncher or excavator with grab tool to minimise impacts to other non-juvenile koala habitat trees, and where not possible and for selective hand-clearing ensure that trees and shrubs being cleared fall towards the centre of the area to be cleared, to prevent incidental damage to non-juvenile koala habitat trees to be retained (those outside the delineated clearing area) l) Cover excavations installed in or within 250 m of koala habitat areas. Covers are to be installed where exclusion fencing has not been erected m) Clearing of trees is carried out in a way that ensures habitat links are maintained within the clearing site and adjacent areas.		
18.5.3	10 days prior to any planned disturbance, a Rapid Fauna Assessment will be undertaken to verify no change to pre-clearance ecology values (>6 months identified), mark habitat and to relocate any found fauna. The Rapid Fauna Assessment will be undertaken by a suitably qualified and experienced Ecologists. The Rapid Fauna Assessment is to confirm that there are no protected matters found that were not described by the EIS and significantly impacted. For newly discovered protected matters, construction works will cease, and the Client notified to determine the action with the Federal Minister. The UGL pre-clearance checklist will be completed for this assessment. This Raid Fauna Assessment will include identification of any emerging weeds since post pre-clearance weed treatment to determine any residual weed clearing requirements during construction/change to planned clearing methods.	JV Environment Manager	UGLMS-131-389
18.5.4	The JV will engage FSC companies who will hold compliant permits and approvals, with documented Safety, Environmental and Quality systems, including: • Damage Mitigation Permit • Rehabilitation Permits • General Fisheries Permit • Animal Ethics Permit.	The JV Contracts Manager Environmental Representative	Legal requirement
18.5.5	Obtain a project specific approved Species Management Program (SMP) from DES for tampering with animal breeding places “low risk of impacts” for Least Concern animals (excluding Special Least Concern or colonial breeders).	The JV Environment Manager	Legal requirement
18.5.6	Obtain a project specific approved SMP from DES for tampering with animal breeding places “high risk of impacts” for all other protected animals including Special Least Concern animals and colonial breeders.	The JV Environment Manager	Legal requirement

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	Include identified species specific information for the approval.		
Construction			
18.5.5	Qualified FSCs will be present and observe all clearing activities.	The JV Supervisor	CopperString 2032 EIS CoG Report – Appendix 4 Commitment 13
18.5.6	Planning and consultation between the clearing contractor and FSC will occur prior to clearing activities starting. The following will be discussed and agreed on: • Separation distance to equipment dependent on habitat complexity • Potential bird strike areas identified will be evaluated by environmental specialist to determine if and where installation of diverters is required • Pace of works • Number of FSC required • Key species of interest based on habitat characteristics • Method of communication when the FSC is required to enter the working zone of plant and equipment to closely inspect a habitat feature • Protocol in the event of a fauna injury. In the event of a fauna injury, at a minimum the FSC will act in accordance with their Rehabilitation Permit and follow best practice guidelines including Code of Practice: Care of Sock, Injured or Orphaned Protected Animals in Queensland, and animal ethics laws. Potential bird strike areas identified will be evaluated by environmental specialist to determine if and where installation of diverters is required.	JV Supervisor JV Environment Manager	UGLMS-131-389 HSE Specification
18.5.7	Directly in advance of clearing equipment (maintaining equipment exclusion zones), the FSC will inspect vegetation and marked habitat / potential breeding areas, and where necessary relocate fauna in accordance with approvals / permits. Suitable nearby habitat will be determined in advance of clearing works and discussed in consultation with the Landholder. Specifically, Squatter Pigeon habitat is to be “flushed” or walked through immediately prior to being cleared.	The JV Supervisor	Legal requirement MNES Management Plan SMP Species Management Program
18.5.8	All fauna data will be recorded digitally (as per specific requirements of the SMP) including: • Species identification • Number of species relocated • Location of interaction • Fauna injury and deaths. A record of all listed dead fauna as a result of project activities will be entered into Synergy as an Incident. Injury or death to MNES species will be reported to PQ immediately.	FSC	Species Management Program
18.5.9	Record habitat features and retain, where practical, ensuring that the habitat features will not impact on the safe and reliable operation of the asset.	JV Environment Manager	HSE Specification

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
18.5.10	Dead or injured fauna will be removed immediately from trenches/excavations, felled habitat, access tracks and roadways to reduce the impact of scavenging species being entrapped or injured by construction works. These will be reported to the Powerlink Environmental representative	The JV Supervisor	HSE Specification
18.5.11	No domestic pets are allowed on site.	The JV Supervisor	UGLMS-131-389
18.5.12	If a threat to an animal is evident onsite the worker will contact their supervisor and/or EA. Works may need to cease if the animal is in danger or harmed until it has been relocated. Where no FSC is available, wildlife handling in emergencies will be done by a trained person.	The JV Supervisor Environmental Advisor	HazOb UGLMS-131-389
18.5.13	Any damage to livestock to be reported immediately to The JV Supervisor who will report to the Construction Manager/Superintendent who will report this to the Stakeholder Engagement Manager.	The JV Supervisor	Land Access Protocol
18.5.14	All access track and roadway speed limits must always be followed. Where deemed appropriate “go slow zones” (40km/h) will be established, this may be in rocky outcrops, wetlands or areas of high fauna significance. These areas will be appropriately signed.	The JV Supervisor	UGL TMP CopperString 2032 EIS
18.5.15	Fauna records will be reviewed weekly to determine hot spots for threatened species to ensure adequate controls around access/working within are introduced as required to minimise deaths post clearing during ongoing earthworks and electrical works.	The JV Supervisor	UGL TMP CopperString 2032 EIS
18.5.16	A project specific significant fauna identification guide will be developed and be provided to project personal and promoted as required at toolbox/pre start meetings. All personnel will maintain a copy of this guide in their transport and in environmental work packs.	The JV Supervisor/EA	CopperString 2032 EIS
18.5.17	Where needed, FSC with aquatic experience will be engaged to assess and coordinate dewatering / construction works where aquatic fauna needs to be relocated and/or managed in a way that avoids injury / fatality.	The JV Environmental Manager	Best practice
18.5.18	If a koala is found prior to or during clearing activities, it must not be forcibly relocated. Any tree that has a koala present, as well as any tree with its crown overlapping that tree, must not be removed and remain in place until the koala vacates the tree of its own accord.	The JV Supervisor/EA	CopperString 2032 HSEMP
18.5.19	Post clearing, dependent on the requirements of the RMP, there may be requirement for targeted fauna species surveys to determine recovery status. (placeholder)	JV Environment Manager	RMMP
18.5.20	Any works at night, as authorised by an out of Hours Permit, will ensure light spill is not directed towards retained vegetation.	The JV Supervisor	CoG Report, Appendix 2, Part B, Condition 32
18.5.21	Environmental controls in Short beaked Echidna habitat: • Identified habitat areas will be in Powerlink GIS system	Project manager and JV Supervisor	HSE Specification section 9.8 (o)

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	• All vehicles, plant, equipment, and machinery to remain within the designated access tracks in identified habitat areas.		
18.5.22	Environmental controls in Australian Painted Snipe habitat: • Identified habitat areas will be in Powerlink GIS system. • Due to the location of nests (on ground) and the ground dwelling nature of the birds, all vehicles, plant, equipment, and machinery will remain within the designated access tracks in identified habitat areas.	Project manager and JV Supervisor	HSE Specification section 9.8 (p)

18.6 Noise & Vibration Management

Environmental Management Sub Plan: Noise and Vibration Management Plan	
Environment Objectives	• Effectively manage construction activities to ensure noise and vibration impacts are minimised • Comply with the requirements of the contract for project and traffic noise and vibration • Ensure project equipment has adequate noise prevention safeguards and is maintained in good working order.
Target	• No effect on adjoining properties as a result of noise or vibration from project activities • Compliance with environmental and safety legislative requirements for noise and vibration • No complaints relating to noise or vibration arising from project activities.
Legislation	• *Environment Protection and Biodiversity Conservation Act 1999* • *Environmental Protection Act 1994* (+ regulation 2008) • *Environmental Protection (Noise) Policy 2019* • *Work Health and Safety Act 2011*
Approvals	• As per Appendix D 'Regulatory Approvals Plan'
Monitoring	• Risk based noise and vibration monitoring for high impacting activities in close proximity to sensitive receptors to verify compliance with acoustic quality objectives • Weekly environmental inspections for generic noise approval conditions • Noise/vibration monitoring in the event of a complaint.
Reporting	• Complaint triggered.
Corrective Actions	• Noise/vibration monitoring to validate a complaint • Review type and operation of plant and equipment • Change the traffic management plan including alternative haulage routes, and/or access restrictions • Schedule noisy activities in consultation with impacted Stakeholders • Implement respite breaks/acoustic treatment/relocation (tiered approach) for noisy plant and equipment operations where noise limits are exceeded at sensitive receptors.

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
Pre-Construction			
18.6.1	Where possible quieter / less vibration-emitting construction methods will be assessed throughout design process.	The JV Supervisor/PM	Environment in design
18.6.2	Noise during construction has the greatest potential to impact on livestock. Landowners will be consulted as part of the construction scheduling process to manage stock access and potential impacts. Noises associated with drilling, small scale blasting (if required, this is dependent on geological basement ie. rock foundation type) and in particular helicopter stringing may impact on stock.	Stakeholder Engagement Manager	Land access agreements
18.6.3	Siting and operation of construction camps must consider noise from the following sources in the planning and development of the facilities for sleeping and amenity: • Road traffic • Rail. The siting and operation of accommodation facilities must consider social impacts by predicting noise impacts and identifying measures in design for siting of and operating high noise and vibration impacting activities such as:	The JV Camp Designer	CoG Report – Appendix 2 Condition 14 CoG Report – Appendix 5 EIS commitment 105

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	• Concrete batching plants • Motor vehicle workshops • Sewage and water treatment plants • Washdown bay operations • Out of hours deliveries • Use of heavy plant and equipment in laydown areas.		
18.6.4	Should small-scale blasting be required, a Blast Management Plan will be developed by a suitably qualified person to assess potential impacts to surrounding sensitive receivers and inform management measures including consultation with property and/or asset owners.	Project Director	Best Practice & Legal requirement
Construction			
18.6.5	Undertake construction activities within nominated hours of work to comply with contractual and legal requirements. A JV Out of Standard Hours Works Permit must be obtained prior to commencing work outside of allowable hours for the site. The standard hours for construction work will be 6:30am to 6:30pm Monday to Saturday. Camp operations may exceed this period for worker safety, but this will not apply to high-impacting activities without an out of hours approval from Powerlink (such as concrete batching plant operation out of hours). The contractor is to notify Powerlink should they wish to work outside of these nominated times for prior approval. Noise limits apply under the *Environmental Protection Act 1994.*	The JV Supervisor Project Director	CopperString 2032 EIS – Volume 2 Chapter 11 Noise and vibration

18.6.6	An Out of Hours Works Protocol (OOHW Protocol) will be developed for the project encompassing the process and procedure for out of hours works required for the project. This protocol will incorporate:
	• Acceptable justification for out of hours work to be undertaken
	• Identification of risk level based on impacts to sensitive receivers, encompassing:
	  ○ Low Risk: assessed as inaudible at the nearest sensitive receiver. Out of hours by agreement with the affected landholder for the work
	  ○ Medium Risk: Required by police/ transport authorities to be undertaken outside of standard hours to ensure the safety of the community and the workforce
	  ○ High Risk: Exceeds noise levels as identified under the noise assessment for the affected sensitive receiver.
	Based on assessment guidelines and requirements including the QLD Transport Noise Management Code of Practice: Volume 2 – Construction Noise and Vibration (2023).
	• Notification and consultation requirements
	• Assessment and approval process.
	This OOHW Protocol will be developed in consultation with Powerlink.
		JV Environment Manager	Best Practice

18.6.7	Undertake high noise generating works in accordance with project specific approvals.	The JV Supervisor/PM	Risk Register/SWMS

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
18.6.8	All equipment must be serviced and maintained according to the manufacturer's recommendations, or more frequently if required to minimise noise generated. Machinery is fitted with appropriate noise attenuation devices and will be maintained in accordance with the manufacturer's recommendations.	The JV Supervisor	Manufacture's Specs
18.6.9	Consider neighbours and minimise noise when packing up plant and equipment and/or departing from site. Works may be staged to minimise continued noise and vibration impacts to surrounding stakeholders	The JV Supervisor	Risk Review
18.6.10	Construction machinery, plant and equipment shall be switched off or throttled down to a minimum when not in use.	The JV Supervisor	Risk Review
18.6.11	Plant selection will use least noise and vibration-producing equipment needed to safely and efficiently complete activities.	The JV PM	UGLMS-131-401
18.6.12	Deliveries shall be arranged such that transport vehicles do not park up in local streets and occur within appropriate hours (i.e., as not to cause excess noise after business hours in built up areas). Transport routes should avoid sensitive areas as far as practicable, in accordance with the Road Use Management Plan agreements with Council/DTMR.	The JV PM	CopperString 2032 HSEMP CoG Report – Appendix B MID recommended conditions
18.6.13	Turning points to be located at the end of transport routes where possible to avoid the need for reversing. Non-tonal reversing alarms to be used where practicable	The JV PM	CopperString 2032 HSEMP HSE Specification
18.6.14	Noise and /or vibration motoring will be undertaken on a risk basis (for example, to quantify noise/vibration levels at the commencement of an activity in a high-risk location). Else, monitoring will be undertaken on a non-vexatious complaint basis. The Noise Monitoring Program will be designed by a Suitably Qualified Person and include: • Baseline noise conditions • Noise limits required by the legal framework • Noise sampling techniques and equipment • Sampling locations • Sampling method (including remote data access) • Data analysis and reporting requirements • A copy of the noise monitoring report will be issued to PQ If infrastructure/humans are at risk of vibration, a Vibration Monitoring Program will be designed by a Suitably Qualified Person and include: • Evaluation of sensitive receptors and vibration tolerance (to avoid damage/nuisance) • Vibration monitoring locations • Monitoring equipment/sampling technique (including remote data access) • Notification triggers • Data analysis and reporting requirements. A copy of the vibration monitoring report will be issued to PQ.	The JV Supervisor	CopperString 2032 HSEMP

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
18.6.15	Program loud noise activities to occur at times to minimise noise nuisance to surrounding sensitive receptors. Physical noise barriers such as earth mounds, mobile screens, or noise attenuation devices should be used, where necessary.	Project Manager	Best practice
18.6.16	Noise limits apply to the use of regulated devices (only between 7am and 7pm Monday to Saturday – excluding public holidays) including compressors or generators; grass cutters; impact tools; leaf blowers or mulchers; oxyacetylene burners; electrical, mechanical or pneumatic power tools (chainsaws, drills, sanders, electric grinder, nail gun). The contractor is to notify Powerlink should they wish to work outside of these nominated times for prior approval for this type of equipment where these are to be used in the vicinity of sensitive receivers (i.e. at Camps). Refer also to 18.6.6.	Project Manager	Best practice
18.6.17	Shut down any LPG/ petrol/ diesel-powered equipment generating loud, extraneous (unusual) noise until the source of the noise can be identified and rectified.	JV Supervisor	HSE Specification
18.6.18	Program loud noise activities to occur at times to minimise noise nuisance to surrounding sensitive receptors. Physical noise barriers such as earth mounds, mobile screens, or noise attenuation devices should be used, where necessary.	JV Project Manager	HSE Specification
18.7.19	Deliver and/or remove materials and equipment to and from the site within the approved hours for construction. All transport vehicles will be in good working order and will avoid using exhaust brakes in built up areas adjacent to the work site.	JV Supervisor	HSE Specification
18.7.20	Program loud noise activities to occur at times to minimise noise nuisance to surrounding sensitive receptors. Physical noise barriers such as earth mounds, mobile screens, or noise attenuation devices should be used, where necessary.	JV Project Manager	HSE Specification
18.7.21	Deliver and/or remove materials and equipment to and from the site within the approved hours for construction. All transport vehicles will be in good working order and will avoid using exhaust brakes in built up areas adjacent to the work site.	JV Project Manager	HSE Specification
18.7.22	Ensure transport routes to and from the site are located, where possible, to limit the impact of traffic noise on potentially sensitive areas.	JV Project Manager	HSE Specification
18.7.22	For the operation of plant the following are to be undertaken: • Plant to be turned off when not in use • Plant is to be regularly maintained and repaired or replaced if it becomes noisier • Wherever feasible, turning circles to be created at the end points of vehicle work legs, which should allow trucks to turn and avoid the need for reversing • Non-tonal reversing alarms to be used where practicable.	JV Supervisor	HSE Specification

18.7 Air Quality Management

Environmental Management Sub Plan: Air Quality Management Plan	
Environment Objectives	• Minimal impact on air quality • Dust and atmospheric emissions comply with regulatory requirements • Avoid using ozone depleting substances • Maintain plant and equipment to ensure exhaust emissions minimised.
Target	• No dust complaints • No sustained exhaust or toxic emissions • Offset construction greenhouse gas emissions.
Legislation	• *Environment Protection and Biodiversity Conservation Act 1999* • *Environmental Protection (Air) Policy 2019* • *Work Health and Safety Act 2011*
Approvals	• As per Appendix D 'Regulatory Approvals Plan'
Monitoring	• Risk based air quality (particulates, dust, other) monitoring for high impacting activities in close proximity to sensitive receptors to verify compliance with air quality objectives • Weekly environmental inspections for dust sources/high dust risk activities to determine if controls are effective • Pre-start vehicle inspections • Greenhouse gas emissions from use of fuel and electricity and materials (Scope 1-3 emissions).
Reporting	• Complaint triggered.
Corrective Actions	• Air quality/dust monitoring to validate a complaint • Review type and operation of plant and equipment • Change the traffic management plan including alternative haulage routes, and/or access restrictions (Refer to Traffic Management Plan for management and mitigation of traffic risks, construction management and implementation of traffic management measures) • Reschedule dusty activities in consultation with impacted Stakeholders.

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
Pre-construction			
18.7.1	The area of disturbed land will be kept to a minimum and existing vegetated area will be kept intact for as long as possible prior to clearing.	The JV Supervisor/PM	Design Drawings/ESCP
18.7.2	Sensitive receptors will be identified throughout risk assessment and work planning processes and measures to reduce potential impacts will be determined and implemented prior to commencement of works. As part of design an air (and odour) quality assessment associated with accommodation hubs will be undertaken to inform the MID application based on the proposal to operate high-air impacting activities including: • Concrete batching plants • Motor vehicle workshops • Sewage and water treatment plants and irrigation • Washdown bay operations • Use of heavy plant and equipment in laydown areas • Vehicle trafficking on non-sealed roads/carparks.	The JV Environmental Manager The JV Camp Designer	Risk register

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
18.7.3	During design identify proposed materials and plant and equipment to be used (obtain a copy of the emission certificate) and the period of operation of the plant and equipment for the duration of the project. Estimate baseline carbon (greenhouse gas) estimates using an acceptable calculation method for the project. Dependent on baseline estimates, investigate options for minimising: • Embodied carbon in materials through alternative design/sustainable procurement including but not limited to: ○ Use recycled materials (in lieu of new products) ○ Select (design and purchase) materials based on sustainability performance, for example, preference materials: – With an Environmental Product Declaration – That are Carbon Neutral – From suppliers registered with the Supply Chain Sustainability School – Avoiding harmful ingredients to human and ecological health eg. PFAS – Manufactured with green processes (eg. Recycling, alternative energy consumption, waste diversion from landfill) etc. ○ Use Supplementing Cement Materials in ready mix or pre-cast concrete; and • Greenhouse gas emissions from plant and equipment operation including but not limited to: ○ Replace % of diesel run plant and equipment with electric/greener choices ○ Replace % diesel with biofuels ○ Manage driver behaviour (eg. Low revving, no idling/turn off when not in use, regular servicing) ○ % replacement for all petrol powered plant and equipment with blended ethanol ○ Car pooling ○ Solar power initiatives for example.	The JV Environmental Manager	Carbon Estimate Tool
18.7.4	Prior to construction works, the project will develop a Greenhouse Gas Offset Plan for construction activities. This Plan will address: • Energy efficiency initiatives • Consider the use of renewable energy sources. Minimum option-engineering requirements have been identified in this CEMP in Section 14.	The JV Environmental Manager	CoG Report, Appendix 2, Part B Condition 38
18.7.5	Ensure all vehicles and machinery are fitted with appropriate exhaust systems and devices. Such devices will be maintained in good working order, in accordance with the manufacturer's recommendations and the Commonwealth Department of Infrastructure and Regional Development, Australian Design Rules for Vehicle Emissions.	JV Project Manager	HSE Specification
Construction			
18.7.6	The following controls will be implemented to address air quality management aspects:	The JV Supervisor	Best practice

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	• Sealing of the trafficked areas, tower pads and access roads to reduce water consumption with non-toxic soil binders (in lieu of watering for dust suppression and depleting natural resources) • Fitting equipment with dust collection/suppression devices (e.g: mulchers and chippers) • Stabilising / covering all materials stockpiled for longer than one month (excluding pavement materials and screenings)/other dust sources by grassing, erosion blanketing, emulsion spray or other approved method as per the requirements of the CESCP (and approval from PQ) • Orientating stockpiles in a direction that reduces exposed surfaces to the prevailing winds • Carry out regular visual surveillance of vehicles, plant and equipment working or moving within proximity to residences or other dust sensitive locations. The surveillance is to determine when actions are required to reduce potential dust nuisance • Road use speed controls as per traffic Management plans (i.e. <40km/hr) • Covering loads • Maintaining clean roadways to and from the worksite. These requirements are additional to specifications for clearing timelines in advance of earthworks and P-CESCP requirements that will aid in the management of air quality. Water suppression devices will be used at site compounds and water carts for the line. Avoid or minimise queuing in roadways approaching the worksites or adjacent to other sensitive activities. Minimise queuing of construction vehicles and idling for excessive periods (e.g. more than 5 minutes).		
18.7.6	As part of plant and equipment pre-checks daily will ensure: • No excessive emissions (i.e., visible smoke, odours) • Wear and tear are in line with the manufacturer's servicing, and no service requirements have been missed • Fuel consumption is in line with expected targets. • All vehicles and machinery are fitted with appropriate exhaust systems and devices. Such devices will be maintained in good working order, in accordance with the manufacturer's recommendations and the *Commonwealth Department of Infrastructure and Regional Development, Australian Design Rules for Vehicle Emissions.* Visual monitoring of driving behaviour and operation in the vicinity of sensitive receivers will be undertaken regularly to determine appropriate actions and mitigation to prevent impacts on sensitive receivers. Where any defective vehicles, plant or equipment are identified, operation of this machinery is to cease, and offsite service/maintenance undertaken. For any behaviour based/generated emissions, from poor driving practices, identify repeat operators for education opportunities. Poor driving practices include:	The JV Supervisor & Project Director	Best practice

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	• Idling (i.e., not turning off equipment when not in use) • Revving • Hard turns and breaking.		
18.7.7	Burning of any materials is prohibited onsite.	The JV Supervisor	Best practice
18.7.8	Continuous logging weather stations will be installed on the site for the duration of the Project.	The JV Supervisor	Best practice
18.7.9	All construction plant and equipment must be maintained so they do not emit visible smoke for any period greater than: • 15 consecutive seconds for plant not being registered for use on public roads • 10 consecutive seconds for plant registered for use on public roads.	The JV Supervisor	Legal requirement
18.7.10	Construction activities will be reprogrammed or relocated, if necessary, during periods of strong winds if they produce excessive wind-blown dust. Work will cease where dust has the potential to impact on local community/stakeholders/local parties until additional controls are implemented to eliminate the hazard and minimise dust nuisance at the sensitive receptors. In managing the dust impacts consideration will be given to site conditions, wind direction, wind speed, weather, bushfire smoke soil type and location to sensitive receivers to limit and reduce potential impacts on sensitive receivers.	The JV Supervisor	SWMS/Weekly Weather Report/BOM
18.7.11	Air quality monitoring will be undertaken based on receipt of non-vexatious complaints. The Air Quality Monitoring Program will be designed by a Suitably Qualified Person and include: • Air quality parameters of concern (eg. Respirable crystalline silica, diesel particulate matter, inhalable dust PM10, respirable dust PM2.5, nitrous oxides, volatile organic compounds, odours) • Air quality sampling techniques and equipment • Sampling locations • Sampling method (including remote data access and laboratory analysis) • Data analysis and reporting requirement. The air quality monitoring report will be submitted to PQ.	The JV Supervisor	HSE Specification
18.7.12	All energy consumption/emissions and end use records, and materials, must be kept to comply with sustainability reporting requirements. Trends of energy and material uses will be identified for proactive intervention on site to minimise Greenhouse Gas emissions.	The JV Environment manager	HSE Specification
18.7.13	Ensure chipping/mulching equipment has dust collection devices attached.	The JV Supervisor	HSE Specification
18.7.14	Sulphur Hexafluoride (SF6) shall be handled to minimise the potential for loss to atmosphere. SF6 shall not be intentionally vented to the atmosphere. Report any losses of SF6 gas to PQ. Manage SF6 in accordance with ENA DOC 022-2008 Industry Guideline for SF6 Management.	The JV PM	HSE Specification

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	Personnel handling SF6 shall have appropriate experience and training in correct handling and loss prevention.		
18.7.15	Limit dust inducing activities on days with high levels of bushfire smoke in the air and if wind is blowing towards receptors.	The JV Supervisor	HSE Specification

18.8 Cultural & European Heritage Management

Environmental Management Sub Plan: Cultural & European Heritage Management Plan	
Environment Objectives	• Cultural and non-indigenous heritage management measures fully implemented and no cultural or non-indigenous heritage incidents • Demonstration of compliance of the JV and its subcontractors to the Duty of Care under the Aboriginal Cultural Heritage Act 2003 and the Torres Strait Islander Heritage Act 2003 to take 'all reasonable and practicable measures' to ensure that their activities do not harm Aboriginal/ Torres Strait Islander cultural heritage (Cultural Heritage Duty of Care) • Consultation with all relevant stakeholders if any heritage / cultural items is located.
Target	• No damage to cultural or non-indigenous heritage or archaeological areas • No impact on areas outside the project areas • Comply with approved Cultural Heritage Management Plans • Compliance with procedures for managing unexpected finds.
Legislation	• *Native Title Act 1993 (Cth)* • *Aboriginal Cultural Heritage Act 2003* • *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* • *Heritage Act 1992*
Approvals	• *As per Appendix D 'Regulatory Approvals Plan'*
Monitoring	• Aboriginal cultural heritage monitoring as per requirements of the relevant CHMP (pre, during and post clearing activities/waterway crossings) • Unexpected finds monitoring as triggered • Weekly environmental inspections to verify exclusion zones are being maintained and monitoring is completed.
Reporting	• Unexpected finds.
Corrective Actions	Dependent on the requirements of the relevant Aboriginal Party CHMP.

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
Pre-Construction			
18.8.1	Develop for each Aboriginal Party an agreed Cultural Heritage Management Plan (CHMP)/ Cultural Heritage Management Agreement (CHMA). To translate requirements to construction activities, prepare a Cultural Heritage Management Strategy. As part of enacting CHMP/CHMA requirements, pre-clearance surveys will include cultural heritage clearances. Each cultural heritage party will have different requirements related to the required monitoring across the project site and the applicable cultural heritage management plans will be implemented for the areas on which they apply to the project site. Management of PQ Cultural Heritage related risk is governed by the Powerlink Land Environment Approvals & Cultural Heritage Framework.	Client	CoG Report Appendix 2, Part B Condition 33a(xi) HSE Specification
18.8.2	10 days prior to earthworks, known heritage sites (including Aboriginal or European) near planned construction, or where there is high risk of being disturbed will be demarcated with signage, flagging and fencing as appropriate, and shown on GIS. No access is permitted.	The JV Supervisor	CHMP

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
18.8.3	Specific training by appropriate people will be provided to persons likely to work in close proximity to known heritage areas.	The JV Supervisor	Training needs analysis
18.8.4	Prepare a JV Heritage Unexpected Finds Procedure that complies with CHMP/CHMA and other stakeholder requirements. This unexpected finds procedure is to identify: • Actions to be taken by the workforce • Actions to be taken by the Aboriginal Party • Communication protocols • Process to recommence works. The unexpected finds procedure must address both: European and cultural heritage requirements. Nominally, upon the discovery of potential and/or actual culturally significant Find, the Project will take direction from the project's Heritage Advisor regarding site/artefact security, DES notification/reporting, locked storage, relocation and all other management requirements.	The JV Environment Manager	CoG Report Appendix 4
Construction			
18.8.5	Specific training will be provided to persons likely to work in close proximity to known cultural heritage areas (refer to the training needs analysis). In addition, the Supervisor will: • Familiarise employees and contractors with local Aboriginal traditions and culture, and Aboriginal places and objects • Ensuring that Duty of Care under the Aboriginal Cultural Heritage Act 2003 and the Torres Strait Islander Heritage Act 2003 is met on the project (take 'all reasonable and practicable measures' to ensure activities do not harm Aboriginal/TI cultural heritage) • Encourage and promote knowledge and understanding of and respect for Aboriginal tradition and culture by encouraging conversations and prestart topics/toolboxes.	Client The JV Supervisor	Duty of Care
18.8.6	Disturbance will not commence until Heritage Monitors have undertaken relevant pre-clearance monitoring / inspections and the JV has been provided with evidence (clearance certificates). Assessment of cultural heritage risk posed by activities conducted by PQ contractors and maintenance service providers is to be made by PQ cultural heritage practitioners prior to the activity. PQ responsible for the coordination of cultural heritage monitors on the project for the purpose of construction.	The JV Project Director	CHMP/Agreement HSE Specification
18.8.7	Monitors may be required in certain areas for certain tasks. These must be engaged prior to works commencing. Works must not commence without correct monitors on site or as per respective traditional owners CHMP requirements.	The JV Project Director	*Land Environment Approvals Cultural Heritage Framework* Legal requirement
18.8.8	Clearing and stripping works will advance at a suitable rate to allow ample opportunity for detection	The JV Superintendent/	

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	of artefacts by cultural heritage monitor/s, where required.	Supervisor	
18.8.9	If any heritage, Aboriginal artefacts or materials are found, the JV Heritage Unexpected Finds Procedure will take effect. The unexpected finds procedure will align with requirements of each relevant CHMP and for European heritage, follow the Section 89 notification requirements of the *Heritage Act 1992*. The JV will immediately notify PQ if such a situation occurs. The JV Will complete a: • Cultural Heritage New Find form • Cultural Heritage Sign Off, in consultation with the JV Heritage Advisor.	The JV Superintendent/ Supervisor	UGLMS-131-389 CoG Report Appendix 4 Commitment 112-114
18.8.10	If human remains are uncovered; all work in the immediate area of the remains will stop immediately. The incident will be immediately reported to PQ who will report to relevant authorities. Work will not proceed in the immediate area until appropriate clearance is provided by PQ.	The JV Superintendent/ Supervisor	UGLMS-131-389
18.8.11	For any planned works within a known cultural heritage area, UGL Permit to Enter the Protected or 'No Go' Area must be obtained from the HSE Manager. In deciding this permit, considerations include: • Cultural heritage plan/agreement/other legal and contractual requirements including any supervision/monitoring provisions/duty of care • Alternative options to avoid planned disturbance • Measures to minimise potential impact to cultural heritage values • Unexpected finds process • Education of staff/workers. Works must not commence without the local Aboriginal monitors on site if required.		UGLMS-131-389

18.9 Hazardous Material Management

Environmental Management Sub Plan: Water Quality Management Plan and Dangerous Goods Management Plan	
Environment Objectives	• Avoid / minimise potential human health and environmental effects from exposure to fuels and hazardous chemicals • Establish control measures to prevent and manage accidents, spills and other discharges of environmental hazardous chemicals and dangerous goods to the environment (e.g. water course, groundwater and soils) • Ensure no contamination of land or water occurs as a result of a hazardous material.
Target	• No spills, leakages and/or explosion events that cause environmental harm • All chemicals are to be stored correctly on site.
Legislation	• *Environment Protection and Biodiversity Conservation Act 1999* • *Work Health and Safety Act 2011* • *Work Health and Safety Regulation 2011*
Approvals	• As per Appendix D 'Regulatory Approvals Plan'
Monitoring	Weekly environmental inspections of storages, uses including refuelling, plant and equipment vehicle inspections, disposal, and spill kits present/stocked • Soil or water (dependent on receiving environment in the event of a contaminant release) investigation/monitoring to determine extent of impact and remediation measures.
Reporting	• All spills are to be reported in Synergy
Corrective Actions	• Spill response • Additional storage requirements.

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
Pre-construction			
18.9.1	Prior to bringing new chemicals to Site, the Project must have updated CHEMWATCH (includes register) with a current SDS and risk assessment. SDSs will be available onsite for the storage of chemicals and fuels. Where feasible, the least ecologically toxic fit for purpose option will be used. Hazardous materials will be stored and handled in accordance with AS1940:2004.	The JV Logistics Manager / Supervisor	UGLMS-131-547
Construction			
18.9.2	All machinery and vehicles will be maintained in good condition to minimise the chance of leaks or drips of lubricants, fuels or other fluids. As part of verification, the JV will ensure: • All plant and equipment will have a completed pre-use inspection checklist prior to site access (with records maintained) • All plant and equipment on arrival will be physically inspected by a suitably competent person familiar with the kit • Daily plant and equipment pre-start records will be maintained by the operators.	The JV Superintendent	Project EIS
18.9.3	All fuels and chemicals are to be stored strictly in accordance with all relevant Australian Standards.	The JV Superintendent	Project EIS

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	For hazardous liquids, a minimum bund volume requirement of 110% of the volume of the largest single stored volume within the bund is required except where the storage container is double lined/contains an internal bund (eg. Fuel tanks and self-bunded Dangerous Goods containers). Fuel and chemical quantities will only be stored on site in amounts that are required for site usage and not in excess.		
18.9.4	Designated refuelling area to be marked on site map. The area will be fitted with but should not be limited to appropriate controls such as bunding, oil spill kits and drip trays. Temporary drive in bunding to be used on site (when self-bunded or double skinned tanks are not available) when large volumes of oil are being decanted or handled outside of a permanent bunded area. A suitably sized spill kit will be available for any spills associated with hose or pipe fittings. As required some vehicles/equipment can be filled in situ – drip tray and spill kit required if refuelling in this way. Whilst refuelling is in progress the hose / pump will be attended at all times.	The JV Supervisor	Project EIS
18.9.5	Hazardous material shall not be stored or drained onto the ground, into watercourses or floodplains. Spills of any kind that are not reported or managed will be treated as a non-conformance.	The JV Supervisor	Synergy Reporting
18.9.6	A copy of the SDS for each stored product is to be kept on site in close proximity to the storage area and accessible by all site personnel.	The JV Supervisor	Risk review
18.9.7	Spill response equipment will be available, clearly identifiable and appropriate to the type, location and volume of materials being stored at all times. Aquatic (hydrophobic) spill kits shall be available at worksites in close proximity to waterways.	The JV Supervisor	UGLMS-131-547
18.9.8	Containment devices, including bunds, separators and catch trays, will be used wherever there is a risk of spillage.	The JV Supervisor	UGLMS-131-547
18.9.9	Infield refuelling will not occur within 100m of a watercourse or drainage line. Where plant (e.g. piling rig, screw pile rig) is unable to be relocated, appropriate controls will be implemented to effectively manage this risk. When possible, refuelling will be offsite at an approved refuelling station.	The JV Supervisor	Project EIS
18.9.10	Undertake routine maintenance of plant and equipment for prevention of fuel leaks, visible exhaust emissions or other maintenance issues. General and routine maintenance will be conducted offsite where feasible.	The JV Environmental Manager	UGLMS-131-547
18.9.11	In the event of loss of containment to land, contamination response measures will include the following. • Identifying and reporting the spill • Assessing the spill to determine if it can be safely managed • Controlling the spill to stop/reduce the impact of the spill at the source	The JV Supervisor	UGLMS-131-547 Project EIS

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	• Containing the spill • Clean up and remediation • Disposal of spilt materials and clean up equipment appropriately. Replacement of spent spill kit materials as soon as it is used • Look to prevention of re-occurrences by understanding the causation of the spill and whether any corrective actions/opportunities for improvement are required. For disposal of spilt materials there may be a requirement to investigate the extent of contamination in soil or water by investigation and monitoring programs. Refer to relevant Sub Plans for requirements.		
18.9.12	Testing for the presence of asbestos, lead, chromium, or PCBs on existing assets that may reasonably be expected to contain these hazardous substances, must be taken prior to commencing disturbing works.	The JV PM	HSE specification
18.9.13	All machinery and vehicles carrying additional fuel/oil/diesel over 20 L to be equipped with a spill kit at all times.	The JV Supervisor	HSE specification
	All spills to be managed as follows: 1. Full protective clothing and equipment shall be worn when managing a spill 2. Assess spill (extent and potential to migrate offsite, fire hazard potential, type and volume) 3. Isolate the spill (prevent further spillage, block drains, prevent access to the area) 4. Notification of the spill 5. Clean up and remediation 6. Restock spill kit 7. All wastes from the clean-up process shall be disposed of safely and in accordance with legislative requirements.	The JV Supervisor and JV PM	HSE specification
18.9.14	All staff and contractors interacting with hazardous materials will be required to have training in the emergency management of spills. Evidence of this training will be recorded and maintained.	The JV Supervisor and JV PM	HSE specification

18.10 Waste Management

Environmental Management Sub Plan: Waste Management Plan	
Environment Objectives	• To minimise waste generation and use the waste hierarchy • Wastes to be disposed of in a lawful manner which does not harm the environment.
Performance Criteria	• Re-use and recycle waste whenever practical and dispose of appropriately • Records of all waste transported and received at licensed landfill • Compliance with Commonwealth and State legislation, guidelines and strategies • No contamination of land or water as a result of Project waste management • No adverse impact on visual amenity or complaints from landowners regarding waste management • Establish waste minimisation strategy.
Legislation	• *Environment Protection and Biodiversity Conservation Act 1999* • *Environmental Protection Act 1994 (+ reg)* • *Waste Reduction and Recycling Act 2011*
Approvals	• *As per Appendix D 'Regulatory Approvals Plan'*
Monitoring	• Daily inspections to determine suitable capacity and requirement for ad hoc collections • Waste storage (segregation, reuse initiatives, housekeeping) and disposal • Weekly environmental inspections • Waste reuse on site.
Reporting	• Waste records • Waste reporting as per requirements for regulated waste (may be deferred to waste service provider depending on whether electronic system of waste tracking is in place).
Corrective Actions	• Offsite disposal audit to verity recycling content/diversion from landfill and correct disposal of regulated waste to verify any complaints/incidents • Additional waste storage capacity or more frequent waste collection • Education and awareness in relation to segregation and waste reuse • Activity and purchasing review in the event of excess waste generation compared to baseline targets/nominal expectations • Other dependent on the nature of the finding.

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
Pre-construction			
18.10.1	The relevant licences of waste transport operators and disposal facilities used by the project for waste management will be obtained to ensure they are legally compliant.	The JV Commercial Manager / Environmental Representative	Legal obligation
18.10.2	Responsible procurement will be undertaken with respect to waste management including: • Assessment of packaging of vendors/suppliers to inform project requirements • Return to Supplier residual waste product contract negotiations including but not limited to pallets, cable reels, packaging, other. • Where practical, Project components should be supplied to the sites with minimal excess packaging. This practice reduces on–site waste generation.	The JV Procurement Manager Project Engineers	HSE Specification

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
18.10.3	Update the Waste and Refuse Disposal Management Plan (prepared as part of the EIS), otherwise known as the Waste Management Plan (WMP) to identify, in consultation with local waste service providers, the following: • Waste types • Waste volume estimates for each waste type (having regard to accommodation hub waste assessments) • Waste storage requirements insitu • Waste management requirements as per the waste management hierarchy • Waste disposal coordination plan to identify locally available disposal and recycling options for various wastes for each Local Government Area (including stakeholder consultation with landholders, community groups, Councils, and local waste service providers) • Waste transport requirements • Waste procedure for the management of waste (including any health and safety requirements for hazardous materials) • Waste records and reporting.	The JV Environmental Representative	CoG Report, Appendix 2, Part B Condition 33viii CoG Report Appendix 4, Commitment 66, 96, 153a, 158
18.10.4	As part of detailed design, waste avoidance and reuse will be considered in the selection and procurement of materials, and quality.	Design Manager	WMP
18.10.5	For accommodation facilities with sewage treatment, an activity specific Sewage Treatment Management Plan will be developed to support the application for an environmental authority for the proper design and maintenance of the facility and irrigation area. This Sewage Treatment Management Plan is to address: • Water quality testing (to demonstrate compliance with the standard of treatment installed) and reuse options • Solids disposal • Maintenance of plant and equipment in particular macerators and sprays; and • Soil sampling for design and remediation of effluent irrigation areas. This Plan will likely be required as part of code compliant vs application triggers and therefore will form part of the RAP. For accommodation with water treatment plants, an activity specific Water Treatment Plant Management Plan will also be developed to demonstrate compliance with drinking water guidelines (as part of the Water Source Management Plan), and management of waste (used media, brine, sediment, other).	The JV Environment Manager The JV Contracts Manager Accommodation Provider	Legal requirement
18.10.6	For concrete batching plants, develop a Concrete Batching Plant Management Plan (sub contactor operated with suitable registration) to ensure concrete batching is undertaken in accordance with the Code of Practice for the concrete batching industry.	Subcontractor	Legal requirement
Construction			
18.10.7	The Project will follow the general provisions of the waste hierarchy • Avoid	The JV Project Director/	WMP UGLMS-131-387

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	• Reduce • Reuse • Recycle • Dispose.	Environmental Representative	CoG Report Appendix 4 Commitment 95, 164
18.10.8	As per sustainability requirements, all waste will be tracked and recorded. Waste yields will be compared to baseline estimates monthly to ensure early intervention for any waste streams where there are excessive trends outside the coordination agreements with end users / changes to assumptions in baseline modelling. Monthly records will form part of the project environmental reporting and internal sustainability reporting.	The JV Environmental Manager	WMP
18.10.9	The waste service provider will supply bins (with no integrity issues and all clearly labelled) in line with waste segregation requirements to achieve end use outcomes of the WMP. Waste segregation will include, but not be limited to depending on design option-engineering: • General waste • Organic wastes • Comingled recycling (dependent on recycling strategy) • Packaging (cardboard and plastics) • Steel • Concrete • Timber • Weeds/contaminated materials/regulated wastes • Recyclable bottles (for local charity arrangements). A contract with the waste service provider will also detail the collection frequency, based on waste predictions, and provide reliable records for reporting purposes.	The JV Contracts Manager	WMP
18.10.10	Waste bins and septic will be emptied from the worksite regularly to prevent vermin and pest infestations, overflows and to minimise odours emanating from such areas. All waste bins containing putrescible waste will be enclosed at all times to prevent vermin and pest access. Litter and cigarette butts are prohibited to be disposed of on the ground or in water.	The JV Supervisor	WMP UGLMS-131-387
18.10.11	Where worksites do not have bins due to transient nature of the works, all waste will be collected and transported to the nearest waste storage area for segregation without resulting in littering. Such wastes will generally involve: • Putrescible wastes/co-mingled recycling • Packaging. Where waste quantities exceed ability to carry by personal vehicle, waste bins will be transported internally to these temporary locations for use and then once used/works completed, they will be collected and taken to the nearest waste storage area for offsite transport. Waste awaiting collection is to be left in a tidy and secure manner such that it does not impact on stock,	The JV Supervisor	WMP

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	landholders, or adjacent landholder activities or have the potential to be windblown.		
18.10.12	Waste management at accommodation facilities will be managed by the accommodation provider in line with project WMP requirements and will focus on: • Putrescible waste composting opportunities • Alternatives to single use plastics • Bottle recycling.	Accommodation provider	WMP
18.10.13	Excess concrete and concrete washout is not to be discharged to land or stormwater. A concrete washout facility must always be used. Concrete washout facility locations will be pre-determined and managed as a hazardous storage which is lined will stormwater controls and maintained to prevent overflow. Where surplus concrete is to be crushed and reused, this will be undertaken in accordance with legislation and landowner agreements.	The JV Supervisor	WMP
18.10.14	Concrete batching will be undertaken in accordance with the approved Concrete Batching Plant Management Plan.	Concrete Plant provider	Code of environmental compliance
18.10.15	Sewage will be managed on site using a combination of onsite sewage treatment plants, and portaloos for easement activities. At substations crib facilities with bulky tanks will be used. Portaloos will be transported around the sites/work fronts without spillage and will be inspected daily to ensure adequate capacity for users. Once capacity is reached, maximum 80%, the portaloo will be changed out and stored at the nearest waste storage area for collection by the waste service provider. Bulky tanks will be collected by the waste service provider as required and operate with high level alarms.	The JV Supervisor	WMP
18.10.16	Sewage treatment at accommodation facilities will be undertaken in accordance with the approved Sewage Treatment Management Plan and conditions of approval. All accommodation facilities will have lime stored to treat sewage spills from macerator failures.	Accommodation Provider	Environmental Authority licence conditions
18.10.17	Waste tracking documentation will be maintained for all regulated wastes. The waste service provider will be held accountable for waste tracking documentation (Parts A and B). The contractor must track and report to Powerlink on a monthly basis on all waste disposed of to any offsite facility. At a minimum the report must include; waste types, waste amounts, waste disposal method/type for each waste as part of the Monthly Contractor HSW Performance Report.	The JV Supervisor/	WMP UGLMS-131-387
18.10.18	Rubbish burning is not permitted. There are to be no fires.	The JV Supervisor	WMP UGLMS-131-387
18.10.19	All cigarette butts will be placed in bins provided to reduce pollution and the risk of fire. Smoking is allowed on site only in designated areas, however, if fires and rubbish becomes an issue the PM can implement control measures such as banning of smoking if required.	The JV Supervisor	WMP UGLMS-131-387
18.10.20	Materials (e.g: geo-fabric) that are contaminated with Biosecurity matters from cleaning vehicles, plant,	The JV Supervisor	HSE Specification

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	equipment, and machinery to be disposed at a licensed facility. Soil contaminated with biosecurity matters is to be disposed of in accordance with the *Biosecurity Act 2014* the associated regulation and the Biosecurity Management Plan.		
18.10.21	Chemical and fuel storage facilities will be inspected as part of regular inspections. Where evidence of concrete waste under oil filled equipment is identified with hydrocarbon staining, photos will be recorded as evidence of inspection for future management and remediation. If there is no evidence of hydrocarbon staining, concrete is to be disposed of through the general construction waste stream: • If the concrete contains evidence of hydrocarbon staining, the affected areas must be tested for contaminants prior to disposal from site. Test results are to be submitted for the Powerlink to review prior to removal from site • If testing is positive for hazardous contaminants, the concrete is to be disposed of as regulated/trackable waste.	The JV Supervisor	HSE specification
18.10.22	Uncontaminated excess spoil will be reused as fill around site or to construct ancillary infrastructure (e.g. access tracks, where material is suitable) or reinstatement of eroded areas. Surplus clean fill material will be removed from site and appropriately disposed, if unable to be reused.	The JV Supervisor	HSE Specification
18.10.23	In accordance with the waste management hierarchy, waste materials will be segregated during handling and storage on–site.	The JV Supervisor	HSE Specification
18.10.24	In accordance with the Waste Reduction and Recycling Act 2011, single use plastic bags will not be used during the Project.	The JV Supervisor	HSE Specification
18.10.25	Where practical, Project components should be supplied to the sites with minimal excess packaging. This practice reduces on–site waste generation	The JV Supervisor	HSE Specification
18.10.26	Putrescibles waste will be sorted in closed waste containers to prevent the attraction and breeding of pest and disease vectors such as flies and rodents.	The JV Supervisor	HSE Specification
18.10.27	Contractors shall obtain and submit all disposal receipts to Powerlink once collated following disposal of materials offsite	The JV Supervisor	HSE Specification
18.10.28	The JV must track and report to Powerlink on a monthly basis on all waste disposed of to any offsite facility. At a minimum the report must include the following and can be included as part of the Monthly Contractor HSE Performance Report: • Waste type (i.e. concrete, organic, demolition, steel) • Amount of waste disposed for each type of waste and each disposal type (in mass or volume) • Waste disposal type for each waste type (i.e. recycling, recovery, reuse by third party, treatment, landfill).	The JV Environment Manager	HSE Specification
18.10.29	Excavated soil material will be reused where possible and any contaminated material unable to be remediated must	The JV Supervisor	HSE Specification

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	be disposed of by an appropriately licensed waste contractor to a license waste facility. A disposal permit is required to remove contaminated soil for treatment or disposal from land listed on EMR or CLR.		

18.11 Contaminated Land

Environmental Management Sub Plan: Contaminated Land Assessment Management Plan	
Environment Objectives	• No impact on the surrounding environment as a result of construction activities • No impact on local waterways from contaminated material leachate • Remediation of contamination if found.
Performance criteria	• No explosion on the construction area or surrounding area • No fatality or injured person from the discovery of a potential unexploded ordinance (UXO) • No unmanaged contamination.
Legislation	• *Environment Protection and Biodiversity Conservation Act 1999* • *Environmental Protection Act 1994 (+ regulation)* • *Work Health and Safety Act 2011.*
Approvals	• As per Appendix D 'Regulatory Approvals Plan'
Monitoring	• Scouting will inspect for UXO and evidence of contamination (eg. Former/current livestock dips, mine wastes, chemical storage, landfills) • Weekly environmental inspections to verify unexpected finds process followed, if applicable • Investigations and monitoring in the event of contamination.
Reporting	• UXO finds • Duty to notify contaminated land.
Corrective Actions	Dependent on the nature of the find. May include: • Further investigation/development of site-specific plans • Clean up (remediation) and disposal • Consultation with relevant Government authorities.

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
Pre-Construction			
18.11.1	Prior to construction a detailed survey will be undertaken of the preferred alignment, associated with scouting to confirm any presence of UXO or contaminated land based on visual indicators. For UXO, visual indicators will be determined in consultation with the landholders and Australian Government Department of Defence. Key focus will be at the 7 potential properties which may contain UXOs east of Charters Towers. For contamination (including acid sulfate soils), field indicators will include: • Discolouration of soil • Wastes mixed with soil • Iron staining • Dead/dying vegetation • Strong smell of rotten eggs from the soil/water environ. The final design will seek to avoid UXO and contaminated land disturbance through refinement of tower siting and stakeholder consultation.	The JV Environment Manager Design Manager	Project EIS
18.12.2	If no record of an EMR or CLR listing is found and contamination has been discovered, geotechnical investigations are undertaken prior to construction. This will include an assessment for the presence of any unforeseen		

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	actual or potential contamination prior to excavation or other earthworks for sites listed on the EMR or where suspected contamination exists. Should contamination be confirmed, on-site remediation of contaminated soil is considered best practice, with removal of contaminated soil for treatment or disposal off-site only to be carried out when that option is not practicable. A Soil Disposal Permit must be obtained from the Regulator to remove contaminated soil for treatment or disposal from land listed on EMR or CLR.		
18.11.3	Where areas of acid sulphate soils have been identified or are likely. The Contractor must ensure no release of contaminants from the oxidisation of acid sulphate soils (ASS) outside the work area or into any sensitive receiving environments by undertaking the following: • Prior to any soil excavation work in high-risk areas (below 5 m AHD), undertake investigations in accordance with the Queensland Acid Sulphate Soils Technical Manual to determine the presence of ASS • Where ASS has been identified, ASS Management Plan is to be developed in accordance with the Queensland Acid Sulphate Soils Technical Manual • All staff and contractors undertaking soil disturbing work in high-risk areas or where ASS has been identified, must complete training/ awareness on the identification and management of ASS.	The JV Project Manager	HSE Specification.
18.11.4	Where disturbance to known contamination (based on field indicators) is proposed based on design, undertake a targeted investigation to confirm contamination and acid sulfate soils, specifically soil sampling in accordance with relevant standards and specifications. The investigation will identify construction requirements and whether to: • Notify contamination under general environmental duty triggers • Prepare a dedicated Site Management Plan (for contamination) for approval by the Regulator • Prepare a dedicated Acid Sulfate Soil Management Plan. Contaminated Land sampling and analysis as referenced in section 9.11 of HSE Specifications for Contractors and Suppliers (Volume 5 - Principal Information Documents) will be undertaken where required as part of the investigation.	The JV Environment Manager	Legal requirement
18.11.5	Workers must comply with any site management plans applicable to a contaminated land parcel	The JV supervisor	HSE specification
18.11.6	Where disturbance to UXOs and contaminated land has potential to occur based on detailed survey and stakeholder consultation, develop an Unexpected Finds Procedure to document the steps in the event of a discovery. The unexpected finds procedure for UXO and contamination finds can be combined with the unexpected finds procedure for cultural and European heritage.	The JV Environment Manager	Project EIS
Construction			

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
18.11.7	In the event an unexploded UXO and contaminated land, all works must cease in accordance with the unexpected finds procedure. The area will be barricaded and signed with exclusion signage (No-go zone). Powerlink and the police will be immediately notified to instigate a request for Defence personnel to attend and dispose of the item. Without disturbing the item, a photograph, description of the item and the exact location will be recorded and its location safely marked. The Supervisor must notify the Environment Manager with the details. The Environment manager will determine next steps of the procedure that are applicable including: • Supervision requirements • Management controls • Disposal methods. Works are not to recommence without approval from the Environment Manager.	The JV Supervisor	Unexpected finds procedure
18.11.8	Where known UXO and contamination is to be disturbed, comply with the relevant dedicated plan developed pre works. Compliance with dedicated plans may include: • Treatment/remediation • Disposal and verification. When disturbing UXO or contaminated land, a suitably qualified person will be present to supervise the works. The disturbance of the UXO or contaminated land will be undertaken prior to any immediate earthworks in the vicinity, preferably pre-construction if this is coordinated with other early works programs.	The JV Supervisor Suitably qualified person	Disturbance Permit
18.11.9	All waste products and hazardous substances with the potential to cause contamination must be appropriately stored and managed to prevent an accidental release of contaminants to the environment.	The JV Supervisor	Best practice
18.11.10	Spill response material and equipment must be available and in proximity to potential contamination sources and with capacity to contain and control. In the event of a release of contaminants to ground, spill response measures must be immediately deployed (where safe to do so) to contain and clean up the spill.	The JV Project Manager and supervisor	Best practice & HSE Specification
18.11.11	All waste products and hazardous substances with the potential to cause contamination must be appropriately stored and managed to prevent an accidental release of contaminants to the environment.	The JV Project Manager and supervisor	Best practice & HSE Specification
18.11.12	Prior to undertaking soil disturbing work at a Powerlink owned site or site where Powerlink assets are present on land parcels owned by others, a review of the Environmental Management Register and Contaminated Land Register (EMR/CLR) will be undertaken.	The JV Project Manager and supervisor	Best practice & HSE Specification
18.11.13	Workers must comply with any Site Management Plan applicable to a contaminated land parcel.	The JV Project Manager and supervisor	Best practice & HSE Specification

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
18.11.14	For contaminated land the following actions shall apply: 1. The Contractor must advise Powerlink if works require movement of any soil (for disposal or stockpiling) from a land parcel listed on the EMR or CLR (including to an adjacent land parcel) 2. Soil sampling and analysis must be in accordance with AS4482.1-2005 Guide to the investigation and sampling of sites with Potentially Contaminated Soil – Part 1: Non-volatile and semi-volatile compounds. 3. In situ soil samples are to be collected prior to excavation from the nominated excavation works area, at a frequency of either 1:10 metres for trenches or 1:100 m2 for non-trench areas. Where in situ soil sampling is not possible, soil stockpile sampling is to be undertaken at a rate of 1:25 m3 up to 500 m3, and 1:50 m3 for soil quantities greater than 500 m3. 4. All soil samples will be analysed for the following: ○ pH ○ Heavy metals (Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Zinc and Mercury) – total and TCLP ○ Total recoverable hydrocarbons (TRH) (Benzene, Toluene, Ethylbenzene, Xylenes and Naphthalene (BTEXN)) 5. Polycyclic aromatic hydrocarbons (PAHs) 6. Asbestos presence If the substation is > 25 years old, samples will also be analysed for: ○ Polychlorinated biphenyls (PCBs) ○ Organochlorine pesticides (OCPs) ○ Organophosphorus pesticides (OPPs).	The JV Project Manager and supervisor	Best practice & HSE Specification
18.11.15	Analysis for additional potential contaminants may be required based on the EMR/CLR listing specific details. At least one soil sample will also be analysed for cation exchange capacity (CEC); clay content (% clay); and total organic carbon content (TOC). This sample should be at least 500g to enable clay content analysis to be completed. Analysis for additional potential contaminants may be required based on the EMR/CLR listing specific details. If the site is listed on the EMR/CLR refer to the HSE Representative.	The JV Project Manager and supervisor	Best practice & HSE Specification
18.11.16	If evidence of contaminated soil or a contamination source is identified during work (such as oil staining, buried asbestos sheeting, surrounding previous land use or previous land use of herbicides or pesticides), soil sampling, investigation, and/or notification will be required.	The JV Project Manager and supervisor	Best practice & HSE Specification
18.11.17	If soil analysis identifies a contaminant that exceeds the residential contaminated land thresholds and the site is not on the EMR or CLR, or the existing listing does not cover the land parcel for the contaminant identified, Powerlink shall be notified. Formal notification of certain events involving contaminated land to DES will be required by Powerlink.	The JV Project Manager and supervisor	Best practice & HSE Specification
18.11.18	If contamination is present above the contaminated land thresholds for the land use (e.g. Industrial or Commercial) and a potential HSE risk to site users has been identified, a combined Stage 1 Preliminary Site Investigation and Stage 2 Detailed Site Investigation in accordance with National Environment Protection (Assessment of Site	The JV Project Manager and supervisor	Best practice & HSE Specification

Action	Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
	Contamination) Measure is required by a suitably qualified person (SQP) as defined in the Environmental Protection Act 1994.		
18.11.19	Prior to the transport or disposal of “contaminated soil” (as defined in the Environmental Protection Act 1994) from a property listed on the EMR or CLR obtain a Soil Disposal Permit. Soil Disposal permits are only issued for the removal of contaminated soil to licensed waste disposal or treatment facilities that are able to receive the soil. Written acceptance from the owners of licensed waste disposal or treatment facility where the soil is to be received must be obtained prior to disposal and made available to Powerlink upon request. The contractor must advise Powerlink if works require movement of any soil (for disposal or stockpiling) from a land parcel listed on the EMR or CLR (including to an adjacent land parcel).	The JV Project Manager and supervisor	Best practice & HSE Specification
18.11.20	If sites are listed on the EMR or CLR and have an attached documented Site Management Plan issued under the Environmental Protection Act 1994, compliance with the conditions of the Site Management Plan is required.	JV environment Manager	HSE Specification
18.12.21	All plant and equipment must be operated and maintained to eliminate or minimise the risk of the escape of contaminants to the environment.	The JV Project Manager and supervisor	HSE specification

Appendix A CoG Report Cross Reference

Note: Appendix 1 – Appendix 3 replicated below as per CoG Report excepting where paraphrased (identified in condition column and italicised requirement text).

Section	Aspect	Condition	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 1	Social	1	The proponent must advise the Coordinator General in writing of the commencement of project construction within twenty (20) business days of the date of commencement.	Environmental reporting requirement	Section 11.2	Pre works
Appendix 1	Social	2 (paraphrase)	*SIMP submission due 3 months prior to construction + SIMP requirements*	Not addressed by this Plan.	Related document	
Appendix 1	Social	3 (paraphrase)	*Communications and Stakeholder Engagement Plan to be submitted as part of the SIMP*	Not addressed by this Plan.	Related document	
Appendix 1	Social	4 (paraphrase)	*Annual Social Impact Management Plan Report*	Environmental reporting requirement	Section 11.3	During works
Appendix 2	MID application	Part A1	The location and design of the project alignment and supporting infrastructure components including in a MID request(s) should generally reflect the alignment and components of the project assessed in the EIS and evaluated in the Coordinator General's evaluation report for the project. MID request(s) may be made for delivery the project as described in the EIS in stages.	Refer to CEMP - Develop a Regulatory Approval Plan	Section 3.3.1	Pre works
Appendix 2	MID application	Part A2	Any MID request(s) must include reference to the project EIS and the Coordinator-General's evaluation report for the project including conditions, recommendations and proponent commitments.	Refer to CEMP - Develop a Regulatory Approval Plan	Section 3.3.1	Pre works
Appendix 2	MID application	Part A3	Any MID request(s) must ensure that the current versions of State Development Assessment Provisions (SDAP) and/or vegetation mapping are used and referred to in any MID request(s).	Refer to CEMP - Develop a Regulatory Approval Plan	Section 3.3.1	Pre works
Appendix 2	MID application	Part A4	Any MID requests(s) must include a report on outcomes of consultation with relevant local government councils. This report should detail: • preferred worker accommodation arrangements with each council, including: – location of accommodation, and whether this requires construction of a new facility or upgrade/use existing facility. – appropriate servicing arrangements for the facility/facilities – detail induction arrangements for each location to address potential impacts on local communities • waste disposal arrangements where use of council waste facilities has been agreed.	Refer to the Stakeholder Management Plan. Regulatory Approvals Plan to include consultation outcomes.	Section 3.3.1	Pre works
Appendix 2	MID application	Part A5	Any MID request(s) must include a report on consultation with owners/operators of existing infrastructure (rail, road, electricity, gas) detailing agreements on crossing separations and any planed outages to operation of existing infrastructure due to commencement of the action.	Refer to the Stakeholder Management Plan. Regulatory Approvals Plan to include consultation outcomes.	Section 3.3.1	Pre works
Appendix 2	MID application	Part A6	Any MID request(s) is to include a report on consultation with directly impacted landholders detailing: • potential locations of project infrastructure, components and activities for each property • how potential land use conflicts and amenity considerations are to be managed for each property • access and options agreements reached with landholders, and ongoing engagement or negotiations.	Refer to the Stakeholder Management Plan. Regulatory Approvals Plan to include consultation outcomes.	Section 3.3.1	Pre works
Appendix 2	MID application	Part A7	Any MID request(s) is to include a report on consultation with DRDMW and relevant local government councils regarding the use of existing licensed and authorised water sources during construction. This report should detail outcomes of this consultation and detailed agreed water supply solutions for construction of the project.	Refer to the Stakeholder Management Plan. Regulatory Approvals Plan to include consultation outcomes.	Section 3.3.1	Pre works
Appendix 2	MID application	Part A8	Any MID request(s) must report outcomes of consultation with relevant local government councils, DAF and other relevant government agencies regarding waterway crossings for project access tracks. This should include any requirements for waterway barrier works approvals associated with access tracks for the project identified through this consultation.	Refer to CEMP - Develop a Regulatory Approval Plan	Section 3.3.1	Pre works
Appendix 2	MID application	Part A9	Any MID request(s) is to include updated information on progression of desktop flood risk studies, including detailed hydraulic modelling, to confirm predicted project impacts to existing flood regimes.	Not addressed by this Plan.	NA	
Appendix 2	MID application	Part A10	Any MID request(s) for the project which intersects the Ballara Nature Refuge is to specifically report on consultation progress with the Ballara Nature Refuge landholder, and on progress made by that landholder in engagement with DES regarding revocation of part of the Nature Refuge and development of an updated conservation agreement.	Refer to the Stakeholder Management Plan.	Section 3.3.1	Pre works

Section	Aspect	Condition	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 2	MID application	Part A11	A TIA which complies with the Department of Transport and Main Roads' Guide to Traffic Impact Assessment to the Department of Transport and Main Roads is to be provided within a MID request. The TIA will include a detailed rail impact assessment, supplied to Queensland Rail and TMR detailing the traffic volumes expected to traverse level rail crossings, the frequency and period of operation. This will include peak traffic volumes, such as daily workforce movements in addition to heavy, over dimensional vehicles that will cross rail structures including level crossings.	Not addressed by this Plan.	Section 18.1 includes environmental review of this related document	Pre works
Appendix 2	MID application	Part A12	The proponent is required to consult the Port of Townsville regarding berth availability and height restrictions for transport of project components and material and report on this consultation and outcomes in information provided to support the MID request(s).	Not addressed by this Plan.	Related document	
Appendix 2	Approval applications	Part B1 (paraphase)	*Implement the commitments, mitigation and management measures considered in the COG Report including the:* *- Proponent commitments* *- CEMP* *- OEMP*	Refer to CEMP - Appendix A for cross referencing table	This Plan	During works
Appendix 2	Approval applications	Part B2	Prior to commencement of the action, provide a report on consultation with owners/operators of existing infrastructure (rail, road, electricity, gas) detailing agreements on crossing separations and any planed outages to operation of existing infrastructure due to commencement of the action.	Refer to the Stakeholder Management Plan.	NA (other than approval related addressed in Section 3.3)	
Appendix 2	Approval applications	Part B3	Prior to commencement of the action, the proponent must obtain in-principle support from the Department of Resources for the construction of the project as assessed in the EIS prior to registration of easements on State leasehold land.	Not addressed by this Plan.	Section 3.3.1	Pre works
Appendix 2	Approval applications	Part B4 (paraphase)	*Consult, provide information and report on consultation outcomes with impacted landholders (in accordance with the EIS "Land Access Strategy".*	Refer to the Stakeholder Management Plan.	NA	
Appendix 2	As Built	Part B5	Following completion of construction works for the project, submit a shape file of the final location of the transmission line towers, substations, maintenance access tracks and any other permanent infrastructure to the Department of State Development, Infrastructure, Local Government and Planning (DSDILGP) (infrastructuredesignation@dsdilgp.qld.gov.au).	Refer to the Stakeholder Management Plan.	Section 18.4	Post works
Appendix 2	Traffic	Part B6 (paraphase)	*Prior to commencement, finalise the TIA.*	Not addressed by this Plan.	Section 18.1 includes environmental review of this related document	Pre works
Appendix 2	Road Use	Part B7 (paraphase)	*Prior to commencement, prepare a Road Use Management Plan and Construction Traffic Management Plan.*	Not addressed by this Plan.	Section 18.1 includes environmental review of this related document	Pre works
Appendix 2	Road Use	Part B8	construction routes, traffic volumes and vehicle details for the action will inform Australian Level Crossing Assessment Model (ALCAM) assessments, in accordance with Queensland Rail's Guide to Development in a Transport Environment.	Not addressed by this Plan.	Section 18.1 includes environmental review of this related document	Pre works
Appendix 2	Road Use	Part B9	Relevant stakeholders must be engaged prior to any maintenance, upgrades or refurbishment work being undertaken to the road network during operation of the project.	Not addressed by this Plan.	Section 18.1 includes environmental review of this related document	Pre works
Appendix 2	Railway environs	Part B10 (paraphase)	*Works adjacent to a railway corridor and railway crossings - excavation*	Not addressed by this Plan.		
Appendix 2	Railway environs	Part B11 (paraphase)	*Works adjacent to a railway corridor and railway crossings - fencing*	Not addressed by this Plan.		
Appendix 2	Railway environs	Part B12 (paraphase)	*Works adjacent to a railway corridor and railway crossings - dangerous goods*	Not addressed by this Plan.		
Appendix 2	Railway environs	Part B13 (paraphase)	*Works adjacent to a railway corridor and railway crossings - railway level crossing safety*	Not addressed by this Plan.		

Section	Aspect	Condition	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 2	Railway environs	Part B14 (paraphrase)	*Works adjacent to a railway corridor and railway crossings - railway noise (construction camps)*	Noise review	Section 18.6	Pre works
Appendix 2	Railway environs	Part B15 (paraphrase)	*Works adjacent to a railway corridor and railway crossings - collision protection*	Not addressed by this Plan.		
Appendix 2	MSES	Part B16	Retain existing mature vegetation unless required to be removed to facilitate the proposed development or respond to an unacceptable safety risk which is to be confirmed by a suitably qualified person. Prior to the commencement of works, undertake the necessary actions to protect vegetation that is not required to be cleared from construction impacts. Relocate any removed habitat features and resources (e.g. large woody debris, tree hollows, logs, rocks) required to be removed to facilitate the proposed development to adjacent areas. Cleared vegetation must: -not be stacked or pushed against mature trees, habitat trees or tall immature trees that is not required to be cleared from construction impacts -not obstruct the flow of drains or watercourse - allow safe passage for stock and vehicles.	Vegetation construction method	Section 18.4	Pre and during works
Appendix 2	MSES	Part B17 (paraphrase)	*a) Any Impacts on MSES including threatened species habitat and Bellara* *b) Nature Refuge must be in accordance with the EIS assessed by the COG Report.* *c) (<insert disturbance tables)* *d) Prior to commencement, pre-clearance surveys are required.* *e) During clearing, a suitably qualified wildlife officer/ecologist is required to be present.* *f) Results of pre-clearance surveys must be submitted to DSDILGP* *g) Biodiversity offsets are to be delivered as identified in the Biodiversity Offset Management Strategy.* *h) Offset obligations for impacts to Bellara Nature Refuge are additional offset requirements.* *i) Final impacts on each MSES are to be confirmed in a post construction audit reported to the Department after construction works.*	Additional environmental studies pre works Vegetation clearing works Offsets not within scope Environment in design	Section 7 Section 18.4 Section 18.5	Pre and during works
Appendix 2	Species Management Program	Part B18 (paraphrase)	*a) Prior to commencement, a Species Management Program is required that must consider pre-clearance surveys.* *b) Each SMP must detail surveys, management measures and relocation requirements.* *C) SMPs are to be lodged with the DES for approval under the NC Act.*	State listed threatened species - NC Act requirement (Secondary approval)	Section 3.3.1 Section 18.5	Pre works
Appendix 2	Rehabilitation Monitoring	Part B19 (paraphrase)	*a) Prior to works a Rehabilitation Monitoring Plan is required.* *b) (RMP requirements)* *c) submit a copy of the RMP to the DSDILGP* *d) Following completion of works, undertake rehab generally in accordance with the RMP*	Rehabilitation planning Rehabilitation monitoring	Section 18.1	Pre and during works
Appendix 2	Biosecurity	Part B20 (paraphrase)	*a) Prior to works prepare a Biosecurity Management Plan.* *B) (BMP requirements)* *c) Submit a copy of the BMP to the DSDILGP* *d) Prior to commencement of works at each location, implement mitigation measures and recommendations of the BMP.*	Biosecurity controls	Section 18.3	Pre and during works
Appendix 2	Biosecurity	Part B21	a) Prior to the commencement of works, undertake a site inspection to confirm the presence of any invasive, declared or pest species (flora or fauna). If found, manage these in accordance with the BMP. b) Following the first wet season after completion of works, undertake a site inspection to confirm the presence of any invasive, declared or pest species (flora or fauna). If found, remove these in accordance with legislative requirements.	Biosecurity monitoring	Section 18.3	Pre and post works
Appendix 2	Waterway Barrier Works	Part B22	Works must comply with the Department of Agriculture and Fisheries (DAF) Accepted development requirements for operational work that is constructing or raising waterway barrier works or liaise with DAF on the construction or raising of waterway barrier works regarding an Operational Works permit. Op Works might be required.	Waterway crossing design and execution	Section 18.2	Pre and post works
Appendix 2	Water Supply	Part B23 (paraphrase)	*a) Prior to commencement of works, Proponent is to develop a Construction Water Plan.* *B) During construction mitigation works and actions are to be undertaken in accordance with the Construction Water Plan.*	Activity specific water source plan	Section 18.2	Pre works
Appendix 2	Emergency management	Part B24	Prior to commencement of works liaise with Queensland emergency service agencies in developing and implementing the project emergency response procedures.	Refer to the Stakeholder Management Plan.	NA	
Appendix 2	Emergency management	Part B25 (paraphrase)	*a) Prior to commencement of works, prepare a Bushfire Management Plan.* *b) (BFMP requirements)* *c) Submit a copy of the BFMP to DSDILGP* *d) Prior to commencement of works at each location, implement mitigation measures and recommendations of the BFMP.*	Bushfire management, informed by vegetation mapping and work scope Existing document	Section 18.4	Pre works

Section	Aspect	Condition	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 2	Emergency management	Part B26 (paraphrase)	*a) Prior to commencement of works, Proponent must prepare and implement a flood emergency and evaluation procedure.* *b) flood emergency and evaluation procedure must be updated for each delivery stage.* *C) employees are to be aware of requirements.*	Related document - include requirements within CEMP as relevant	Related document	
Appendix 2	Stormwater management, erosion and sediment control	Part B27 (paraphrase)	*Prior to commencement of works, prepare a Stormwater Drainage Management Plan.* *B) The SDMP must be consistent with stormwater quality and quantity management measures detailed in the EIS.* *C) Submit a copy of the SDMP to the DSDILGP* *d) Implement best practice stormwater quantity and quality measures in accordance with the SDMP.*	Related document - include requirements within CEMP as relevant	Related document	
Appendix 2	Stormwater management, erosion and sediment control	Part B28 (paraphrase)	*a) Prior to commencement of works, prepare a Erosion and Sediment Control Plan.* *b) Following completion of works, develop and implement an OEMP for mitigation of potential water quality impacts from Stormwater, flooding and impacts to water quality (surface and groundwater).*	Soil management - Overarching CESCP and Progressive CESCPs to be prepared. Requires additional environmental studies.	Section 18.1	Pre works
Appendix 2	Stormwater management, erosion and sediment control	Part B29 (paraphrase)	*a) Stormwater and flooding management must ensure no worsening action to the railway corridor.* *B) (insert requirements)* *c) RPEQ certification is required and supporting documentation submitted to the DTMR.*	Related document - include requirements within CEMP as relevant	Related document	
Appendix 2	Stock Route network	Part B30 (paraphrase)	*a) Transmission towers within a stock route must minimise impacts.* *B) Measures for gazetted stock routes must be documented and implemented.*	Environment in design DES stock route strategy	Section 18.4	Pre and during works
Appendix 2	Contaminated Land	Part B31	a) Project components and activities are to be located away from potentially contaminated land. B) The Australian Government Department of Defence must be consulted prior to the commencement of the action to ensure avoidance of any unexploded ordnance.	Refer to CEMP - Unexpected Finds Procedure	Section 18.11	Pre works
Appendix 2	Lighting	Part B32	All external lighting is installed and maintained to accord with Australian standards and shielded to minimise light spill to the surrounding environment.	fauna light spill management, for night works	Section 18.4	During works (operational condition)
Appendix 2	CEMP	Part B33(a)	Prior to the commencement of works, prepare and submit a Construction Environmental Management Plan (CEMP) to DSDILGP (infrastructuredesignation@dsdmip.qld.gov.au). The CEMP must be consistent with management measures detailed in the project EIS and, and must include/address the following:	This document.	This Plan	Pre works
Appendix 2	Erosion and Sedimentation	Part B33a(i)	an Erosion and Sediment Control Plan (ESCP) developed in accordance with the Best Practice Erosion and Sediment Control Document, prepared by the International Erosion Control Association and dated November 2008, and Queensland's Construction Phase - Stormwater Management Design Objectives, prepared by the then Department of Infrastructure, Local Government and Planning and dated July 2017, that addresses/includes ■ a suitably detailed description of the existing environment ■ a suitably detailed description of proposed clearing and the post-clearing land use ■ an erosion hazard and risk assessment associated with both: } the vegetation clearing operations } the post-clearing activities on the development site ■ a detailed description of the proposed erosion and sediment control measures applicable during: } the vegetation clearing operations } the subsequent land use ■ details of the proposed performance monitoring program and an ESCP review process	Refer to CEMP Sub Plans. Soil management	Section 18.1	Pre works
Appendix 2	Water Quality	Part B33a(ii)	a Water Quality Management Plan which is to include mitigation works and actions, including measures identified in the EIS for the project, to address potential impacts of the project on the aquatic environment	Refer to CEMP Sub Plans. Water management	Section 18.2	Pre works
Appendix 2	Flora and Fauna	Part B33a(iii)	Flora & Vegetation and Fauna Management Plans	Refer to CEMP Sub Plans. Flora and vegetation management. Fauna management.	Section 18.3 Section 18.4	Pre works
Appendix 2	Rehabilitation	Part B33a(iv)	a Rehabilitation Plan for temporary construction sites and cleared areas that includes: ■ rehabilitation measures for disturbed areas as soon as practicable to limit exposure to erosive processes ■ remediation measures for any areas of contaminated land ■ commitments, mitigation, and management measures consistent with those identified in the project EIS.	Refer to CEMP Sub Plans. Rehabilitation Plan Contaminated land will be addressed separately based on nature of contamination.	Section 18.1 Section 18.11	Pre works
Appendix 2	Dewatering	Part B 33a(v)	a dewatering management plan that establishes suitable protocols to treat or remove water from the site, should it be required during construction	Refer to CEMP Sub Plans. Dewatering	Section 18.2	Pre works

Section	Aspect	Condition	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 2	Air Quality	Part B 33a(vi)	dust mitigation methods (such as use of water to suppress potential dust) and air quality management measures, within an Air Quality (Dust) Management Plan	Refer to CEMP Sub Plans. Dust management	Section 18.7	Pre works
Appendix 2	Noise	Part B33a(vii)	hours of construction, vibration, and construction noise (including the default noise standards), in accordance with the Environmental Protection Act 1994 (s440R & 440S)	Refer to CEMP Sub Plan Noise and vibration management	Section 18.6	Pre works
Appendix 2	Waste	Part B33a(viii)	a waste management plan detailing: ■ preference of waste management in the following order – avoid or reduce, reuse, recycle, recover, treat and dispose ■ how each waste stream is to be stored, transported and disposed of ■ estimated quantities of waste from each waste stream ■ details of waste transport companies to be utilised and copies of any relevant licenses ■ reporting on consultation with relevant councils regarding disposal at existing council facilities ■ details of waste disposal facilities to be utilised and copies of any relevant licenses and waste acceptance criteria	Refer to CEMP Sub Plans. Waste management. Note reference document.	Section 18.10	Pre works
Appendix 2	Biosecurity	Part B33a(ix)	a Biosecurity Management Plan	Refer to CEMP Sub Plans. Biosecurity management	Section 18.3	Pre works
Appendix 2	Contaminated Land	Part B33a(x)	measures to manage any contaminated land	Refer to CEMP Sub Plan/procedure Refer to CEMP Unexpected Finds Procedure	Section 18.11	Pre works
Appendix 2	Cultural Heritage	Part B33a(xi)	cultural heritage management plans	Refer to CEMP Sub Plans. Cultural heritage	Section 18.8	Pre works
Appendix 2	Hazard	Part B33a(xii)	a Hazard, Health and Safety Management Plan detailing disposal and management of hazardous materials and regulated waste, including removal by a suitably licensed contractor where deemed necessary	Waste disposal of regulated waste addressed in CEMP	Section 18.10	Pre works
Appendix 2	Traffic	Part B33a(xiii)	access locations for and management of construction vehicle traffic	Not addressed by this Plan.	Section 18.1 includes environmental review of this related document	
Appendix 2	Traffic	33a(xiv)	maintenance of safe pedestrian and cyclist access/movement around the site (where relevant)	Not addressed by this Plan.	Section 18.1 includes environmental review of this related document	
Appendix 2	Design	33a(xv)	proximity of works to easements and services and any necessary design measures, additional analysis or safe work methods	Not addressed by this Plan.		
Appendix 2	Approvals	33a(xvi)	other required permits from the council, easement holders or utility providers	Refer to CEMP - Develop a Regulatory Approval Plan	Section 3.3.1	Pre works
Appendix 2	Complaints	Part B33a(xvii)	complaint resolution procedures, including who to contact and a record of how complaints have been addressed	Refer to Stakeholder Engagement Management Plan Environment related complaints addressed	Section 11.4	During works
Appendix 2	Communication	Part B33a(xviii)	a construction communication plan including: ■ how neighbouring properties will be advised of construction activities for each stage ■ how the appropriate extent of neighbouring properties to be notified will be determined ■ timeframes for notification of construction activities to occur prior to works commencing.	Refer to Stakeholder Engagement Management Plan	Related document	
Appendix 2	Implementation	Part B33b	Construction of the development is to be undertaken in accordance with the CEMP.	Governance program	This Plan	During works
Appendix 2	Railway environs	Part B34 (paraphrase)	*a) The construction of the project must ensure no disruption to safety and operational integrity of the existing railway corridor.* *B) For all works within a rail environment, a Construction Management Plan for railway considerations must be prepared and submitted within 3 months. (insert plan details)* *c) Construction of the development must be undertaken in accordance with the Construction Management Plan for railway considerations.*	Not addressed by this Plan.		

Section	Aspect	Condition	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 2	OEMP	Part B35 (paraphrase)	*a) Prior to commencement of operation, prepare and submit an OEMP. (insert plan requirements)* *b) Operation of the action must be undertaken in accordance with the OEMP.*	Not addressed by this Plan.		
Appendix 2	Salinity	Part B36	a) Prior to commencement of works, undertake a geotechnical investigation that confirms the ground conditions and informs building requirements and identifies any salinity expression areas. b) Where salinity expression areas are identified, clearing is to be avoided or minimised.	Additional environmental studies	Section 7	Pre works
Appendix 2	ASS	Part B37	a) If potential or actual ASS is identified during construction, an ASS investigation is to be carried out in accordance with the Queensland Acid Sulfate Soil Technical Manual – Soil Management Guidelines v4.0. b) If detected, construction of the development is to be managed in accordance with management of the soils should be in accordance with the Queensland Acid Sulfate Soil Technical Manual – Soil Management Guideline, version 4.0.	Refer to CEMP Sub Plan/procedure Refer to CEMP Unexpected Finds Procedure	Section 18.11	Pre and during works
Appendix 2	Greenhouse Gas	Part B38	a) Prior to commencing the action a greenhouse offset plan is to be developed and implemented for construction and operational phases of the project which is to: - include energy efficiency initiatives - consider the use of renewable energy sources.	Refer to CEMP Sub Plan Greenhouse gas calculations then offset for construction	Section 18.7	Pre and during works
Appendix 2	Railway environs	Recommendation 1	Advice relating to recommended conditions for the protecting the safety and efficiency of railways	Not addressed by this Plan.		
Appendix 3	MNES - Maximum disturbance areas	Condition 1 (paraphrase)	*Maximum disturbance areas:* *Defined maximum disturbance limits for habitat for listed threatened species* *a) must not impact more than the maximum disturbance limit* *b) project components resulting in impacts to listed threatened species may be carried out in stages as negotiated with the Department.*	Environment in design Vegetation clearing Fauna management	Section 7 Section 18.4 Section 18.5	Pre and during works
Appendix 3	MNES -Pre-clearance surveys	Condition 2 (paraphrase)	*a) Undertake pre-clearance surveys for habitat for listed threatened species at least 6 months prior to commencement of the action* *b) surveys must be undertaken for the habitat for threatened species listed in condition 1* *c) (insert requirements for pre-clearance surveys)* *d) Reconcile outcomes of pre-clearance surveys against maximum disturbance limits and report and variance to the Department.* *e) Prior to commencement at each stage, Proponent must provide to the Department a report, prepared by a SQP, which analyses the estimated impacted habitat for each of the threatened listed species, and for any previous stages, the actual impact extent.*	Pre-clearance surveys (additional environmental studies) GIS evaluation based on design Threatened species management	Section 7	Pre and during works
Appendix 3	Offsets	Condition 3 (paraphrase)	*In consultation with the Department, update the biodiversity offset management strategy (BOMS) to include updated figures of Condition 1 based on pre-clearance survey outcomes from Condition 2, and information to support updated impact figures including (insert details here).*	Environment in design Disturbance database Verification reporting	Section 18.4 (offset not in scope)	Pre works
Appendix 3	Offsets	Condition 4 (paraphrase)	*a) Prepare a Offset Area Management Plan for approval 2 months prior to commencement of works.* *B) each Offset Plan must meet requirements of the Environmental Offset Policy and the EMP Guidelines.* *C) the Offset Management Plan must include (insert details here).* *d) Approval holder must legally secure the offsets within 12 months of commencement (or prior to each stage of works).* *e) Upon commencement, the approved offset management plan must be implemented.*	Not addressed by this Plan.		
Appendix 3	Species Management Plan	Condition 5 (paraphrase)	*a) Submit a Species Management Plan for the Minister approval 3 months prior to commencement of works.* *B) No listed species habitat impacting works is authorised without the SMP approval from the Minister.* *C) The SMP must (insert details here).* *D) For the Koala, implement minimum mitigation measures (insert details here)* *e) For the squatter pigeon, implement mitigation measures (insert details here)* *f) for the night parrot, implement mitigation measures (insert details here)* *g) For the black-throated finch, implement mitigation measures (insert details here)* *h) for the black ironbox, implement mitigation measures (insert details here)* *i) the approved SMP must be implemented.*	Post preclearance surveys prepare this Plan.	Section 18.4	Pre and during works
Appendix 3	Rehabilitation	Condition 6 (paraphrase)	*a) Following construction, actively rehabilitate all areas to reinstate pre-disturbance vegetation community, using endemic native species appropriate to their position in the landscape in accordance with the EIS.* *B) to ensure establishment and long term sustainability of the rehabilitated areas, ensure completion criteria is achieved within 12 months of completion and monitor rehab areas for a further minimum 12 months.*	Rehabilitation planning Rehabilitation monitoring	Section 18.1	Pre and during works

Section	Commitment	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 4	C1	PQ will plan, implement and monitor the mitigation and management measures outlined of the Project Framework Environmental Management Plan and Field Development Plan to minimise and avoid adverse environmental impacts.	Environmental in Design process	This Plan contents Section 7	Pre and during works
Appendix 4	C2	PQ and their technical service partners and Construction Contractors are committed to obtaining all relevant approvals, including all necessary environmental approvals, prior to the commencement of construction relating to the approval trigger and comply with all required approvals and conditions for the Project.	Develop a Regulatory Approvals Strategy	Section 3.3 Appendix D	Pre works (during works dependent on staging)
Appendix 4	C3	Transmission towers will be designed to maintain a mid-span clearance of the transmission line above local terrain incompliance with Queensland legislation.	Scouting. Design Criteria.	Section 7	Pre works
Appendix 4	C4	The potential locations of the associated infrastructure will be finalised during the detailed design of the Project. Sites will be determined after careful consideration of all physical constraints such as sensitive environmental areas, rock/soil types, significant watercourse/infrastructure crossings, existing land use. The finalisation of these sites will be achieved through ongoing negotiations with landholders and consultation with relevant government agencies as appropriate e.g. local councils, Department of Transport and Main Roads (TMR) and the Department of Community Safety.	Scouting. Design Criteria. Refer to Stakeholder Management Plan.	Section 7	Pre works
Appendix 4	C5	The construction program will be structured so that where possible, peak construction activities located in areas susceptible to flooding are programmed to occur outside of the forecast seasonal wet weather period. Areas at high-risk of flooding and erosion will be targeted for construction during the dry months.	Works scheduling.	Section 18.1	Pre and during works
Appendix 4	C6	A Road Use Management Plan (RUMP) will be developed as part of the MID and secondary approvals process and will be implemented prior to and during construction as outlined in the RUMP. Consultation will occur with the relevant transport authorities, such as DTMR, Queensland Rail and local councils during the development of the RUMP.	Not addressed by this plan.	NA	
Appendix 4	C7	Access tracks will generally be contained within the transmission line easement where practical. Existing cleared access tracks are to be preferred for construction use where practical. The access tracks for the Project will be constructed to a standard suitable for dry weather use for 4WDs (and variable terrain heavy machinery) at low speed.	Scouting. Design Criteria. Refer to Stakeholder Management Plan.	Section 7	Pre and during works
Appendix 4	C8	Suitable weed control measures will be implemented during construction and operation of the Project. The Project will consult with local government weed and pest management officers and landholders during the development of Biosecurity Plans for the Project.	Weed treatment.	Section 18.3	Pre works
Appendix 4	C9	Cultural heritage clearance for the Project will be managed in accordance with the Cultural Heritage Management Plans (CHMPs) being developed for the Project.	Heritage management.	Section 18.8	Pre works
Appendix 4	C10	Where work is proposed to be conducted in proximity to a sensitive receptor, the timing of construction will consider the noise, dust, vibration and light impacts of the construction process and of access issues.	Works scheduling. Design criteria - separation distances.	Section 18.6	Pre and during works
Appendix 4	C11	A complaint handling process, including a complaint register, will be developed prior to commencement of construction as part of the Stakeholder and Community Engagement Plan, which will include regular reviews and reporting procedures.	Refer to CEMP - Complaints Procedure	section 11.4	Pre works
Appendix 4	C12	At laydown/delivery areas along the transmission line, deliveries will occur in a manner not to cause nuisance to a sensitive receptor (occupier of a building) outside of the hours of 6.30 am to 6.30 pm Monday to Saturday (asper the requirements of the Environmental Protection Act 1994).	Works scheduling.	Section 15.8	During works
Appendix 4	C13	Appropriate vegetation management measures shall be incorporated in the Construction Environmental Management Plan. These shall include the presence of qualified fauna spotter/catcher(s) during clearing and identification and delineation of vegetation to be preserved.	Flora and fauna management - various	Section 18.4 Section 18.5	During works
Appendix 4	C14	Vegetation clearing will typically be conducted by bulldozers. Heavy duty mulchers may also be used. More refined hand or mechanical clearing methods will be employed for smaller clearing operations in environmentally sensitive areas as defined in the Construction Environmental Management Plan which may include some riparian zones. Vegetation felled near watercourses will be kept out of the channel.	Flora and fauna management - various	Section 7 Section 18.4	During works
Appendix 4	C15	The Project will consult and holders and other stakeholders on appropriate uses for timber of commercial value.	Beneficial reuse	Section 18.4	Pre works
Appendix 4	C16	Ongoing consultation with Landholders and resource tenement holders will continue through development of the Project in accordance with land access protocols. This consultation process may include assessment of alternative corridor routes, outcomes of all realignment must be done in accordance with project change request criteria.	Refer to Stakeholder Management Plan.	Related document	Pre and during works

Section	Commitment	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 4	C17	The Construction Environmental Management Plan shall include erosion and sediment control measures which takes into consideration the International Erosion Control Association's Best Practice Erosion and Sediment Control Guidelines (IECA, 2008). The plan will include onsite drainage, stormwater runoff control, vegetation clearing, earthworks, site exit and egress points and soil stockpile management.	IECA requirements	Section 18.1	Pre and during works
Appendix 4	C18	A plan for the handling and temporary storage of topsoil and spoil during construction activities at the transmission tower sites will be developed as part of the Construction Environmental Management Plan.	topsoil and subsoil management	Section 18.1	Pre works
Appendix 4	C19	In the unlikely event that blasting is required, a licenced contractor will be required to manage all health and safety risks.	Blasting plan if required	Section 18.6	During works
Appendix 4	C20	Helicopters will be employed as the primary means of installing insulator strings, conductor draw lines and overhead earth wires to reduce additional vehicle movements and compaction of soils.	helicopter stringing	Section 18.1	During works
Appendix 4	C21	The transmission network will be subject to a detailed testing and commissioning plan and a number of performance trials to verify the integrity and safety of the transmission lines and substation infrastructure during the commissioning phase and prior to operation. A series of system tests will be conducted to ensure power quality performance and will fulfill any required Australian Energy Market Operator testing.	Not addressed by this plan	NA	During works
Appendix 4	C22	A workforce attraction and retention strategy will be used to assist in establishing and stabilising the workforce for the construction of the Project.	Not addressed by this plan	NA	During works
Appendix 4	C23	PQ will work with local government councils, education and training providers, and labour force suppliers to develop a local business participation strategy and an Indigenous Participation Plan, prior to construction, that will effect: Maximising local participation and employment (including work readiness if appropriate) Maximising Indigenous participation and employment Employment of apprentices and trainees (including work readiness if appropriate).	Not addressed by this plan	NA	Pre works
Appendix 4	C24	Construction camps will be developed (as needed) by specialist contractors that will construct and operate the camps. The contractors will be responsible for ensuring the facilities meet all applicable occupational health and safety requirements, including those relating to food preparation and storage, ablutions and water quality, vector and vermin control and safety and emergency services. All camps will be built to current industry standards and the requirements of local government laws and approval conditions. Meetings will be held with stakeholders from each LGA regarding construction camp locations in accordance with consultation strategies and protocols to engage with regional community hubs and LGA's chamber of commerce for future project development/participation opportunities. Development approvals for workers accommodation will be obtained as part of individual Ministerial Infrastructure Designation Proposals (MID) aligning with the construction hub areas described in the SEIS. However, where agreed with an LGA and suitable to do so, an application for Material Change of Use (MCU) assessable under a local planning scheme may be an alternative for some workers accommodation sites.	Subcontractor management	Section 3.3	Pre and during works
Appendix 4	C25	A Rehabilitation plan that outlines measures for rehabilitating temporary construction sites and associated infrastructure (including temporary construction camps or clearing around substations), following completion of the construction schedule will be developed.	Refer to CEMP - Rehabilitation.	Section 18.1	Pre works
Appendix 4	C26	A Rehabilitation plan outlining the requirements for the rehabilitation of land cleared within the corridor selection during construction will be provided prior to construction. Site and stage-specific rehabilitation sub-plans will also be developed, and include tower assembly areas, tower pads, brake and winch sites, CEV Huts and temporary not required during the operation and maintenance of the transmission infrastructure.	Refer to CEMP - Rehabilitation.	Section 18.1	Pre and during works
Appendix 4	C27	Relevant approvals will be obtained for the use of existing or new bores to access water for the project. Where existing bores are used to access water for the Project, a pump test and drawdown investigation will be undertaken to ensure adequate yields will be available for construction use and for surrounding users. Ongoing monitoring will be undertaken and a management plan developed if yields decrease.	Groundwater monitoring	Section 18.2	Pre and during works
Appendix 4	C28	Water supplied for temporary camps will comply with the Australian Drinking Water Guidelines (2011), version3.5	Drinking water supply and monitoring	Section 18.2	During works
Appendix 4	C29	An adequate communications system will be established as part of the emergency planning and response procedures developed for the Project.	Not addressed by this plan	NA	
Appendix 4	C30	PQ will pursue a designation of premises by the Treasurer, Minister for Infrastructure and Planning or a local government for deployment of infrastructure in accordance with Planning Act, Chapter 2, Part5.	Refer to the Regulatory Approvals Plan.	Section 3.3	Pre works

Section	Commitment	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 4	C31	PQ will pursue regulatory approval to be licensed a as a transmission authority and an electricity entity.	Refer to the Regulatory Approvals Plan.	Section 3.3	Pre works
Appendix 4	C32	The final corridor selection for the Project will require an easement of 120 m in width, for the Renewable Energy Hub and CopperString core transmission line sections to allow for future duplication, 120 m in width for the interconnecting lines with existing circuits at Ergon's Chumvale Substation and 60 m in width for the Mount Isa Augmentation and southern connections to Selwyn and Woodya. Prior to the construction of the transmission network, the easements required for the Project will need to have been acquired by PQ.	Refer to the Regulatory Approvals Plan.	NA	Pre works
Appendix 4	C33	PQ will consult with the owners of any other infrastructure (rail, road, electricity, gas and water) that the Project may cross to detail the transmission line crossing, then once the detailed design and staging of the Project is finalised arrange any planned outages.	Refer to the Stakeholder Management Plan.	Related document	Pre works
Appendix 4	C34	Final design of the Corridor selection will avoid or be suitably distanced form areas including areas of: Cultural significance Contaminated lands Historical working and existing infrastructure.	Scouting. Design Criteria. Refer to Stakeholder Management Plan.	Section 7	Pre works
Appendix 4	C35	In circumstances when it is not possible to avoid, disturbances will be minimised, mitigated and remediated.	Scouting. Design Criteria.	Section 7 Section 15 Section 18 - various	During works
Appendix 4	C36	PQ commits to obtaining relevant Commonwealth, state and local approvals for the construction and operational phases of the Project prior to construction.	Refer to the Regulatory Approvals Plan.	Section 3.3	Pre works
Appendix 4	C37	PQ will prepare and implement an Environmental Management Plan as part of the additional management plans prior to construction.	This Plan. Implement requirements.	This Plan Governance requirements included	Pre and during works
Appendix 4	C38	Separation distances to sensitive land uses will be maintained as far as practical to ensure amenity to visitors and local residents are not adversely impacted	Scouting. Design Criteria.	Section 7	Pre works
Appendix 4	C39	There will be ongoing engagement and consultation with landholders and stakeholders to exchange information on Project infrastructure design and construction to investigate how land use conflicts can be managed.	Refer to the Stakeholder Management Plan.	Related document	Pre and during works
Appendix 4	C40	Rural land fragmentation and disturbance to landholder practices will be avoided and ongoing consultation with landholders will occur during the detailed design to minimise and mitigate disruptions to agricultural production.	Refer to the Stakeholder Management Plan.	Section 7 Section 15.8	Pre and during works
Appendix 4	C41	Exploration and mining lease land will be avoided as far as practicable to mitigate disruptions to current and future mining operations. Consultation with tenure holders will be ongoing during the design and construction phases of the Project to consider how to avoid and minimise disruptions to existing mining operations.	Design criteria. Refer to Stakeholder Management Plan.	Section 7	Pre works
Appendix 4	C42	Infrastructure placed within Stock routes will be avoided as far as practicable to mitigate disruptions to operation of stock routes.	Scouting. Design Criteria. Refer to Stakeholder Management Plan.	Section 7	Pre works
Appendix 4	C43	Further investigations prior to construction will be undertaken to ensure that disused and abandoned workings will be avoided as far as practical to mitigate risk to Project personnel and property.	Scouting. Design Criteria.	Section 7 - scouting	Pre works
Appendix 4	C44	Disturbance to potentially contaminated land will be avoided as far as practical through discussion with landholders to further delineate known sites and identify potential contamination on properties not listed on the EMR. Site Project infrastructure and activities will be located away from potentially contaminated land as far as practical.	Scouting. Design Criteria.	Section 7 - scouting	Pre works
Appendix 4	C45	Further consultation with landholders and other stakeholders such as the Department of Defence will be undertaken to further define UXO risk.	Refer to the Stakeholder Management Plan.	Section 18.11	Pre works
Appendix 4	C46	In-principle approval for the construction of the Project prior to registration of easements on State leasehold land will besought from DNRME. In-principle approval should be appropriately conditioned with consideration to landholder consent, cultural heritage and native title assessments and insurance requirements.	Not addressed by this plan	NA	
Appendix 4	C47	Landholder agreements will be secured and managed in accordance with Volume 3 Appendix E Land acquisition protocol.	Not addressed by this plan	NA	

Section	Commitment	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 4	C48	Mitigation and management measures detailed in Volume 3 Appendix O Visual amenity will be reviewed and considered in detailed design including tower heights, tower placement and vegetation screening for substations.	Design Criteria.	Section 7	Pre works
Appendix 4	C49	An unexpected finds protocol will be developed as part of the environmental management plan with procedures to follow in the event of discovery of fossils or items of heritage significance.	Unexpected finds procedure	Section 18.8	Pre works
Appendix 4	C50	PQ will develop Road Use and Traffic Management Plans which will address wet weather aspects associated with the use of unsealed access tracks. Many soils in the study area are susceptible to varying types of erosion. To mitigate this impact, an erosion and sediment control plan will be developed prior to construction and implemented. These plans will include measures to avoid, manage or mitigate potential risk to soils, including specific reference to management/mitigation of risks associated with salinity, specifically providing evidence of no clearing in salinity expression areas. This will be used in conjunction with a vegetation management plan and rehabilitation plan which will include actions suitable to manage or prevent cumulative impacts to the geology and soils.	Progressive ESCPs	Section 18.1	Pre works
Appendix 4	C51	Direct impact to areas of high ecological value will be avoided or minimised through the process of corridor realignments or spanned across wherever possible using higher towers as appropriate to the ecological values and the terrain constraints. In areas of high ecological value this will enable vegetation below 20 m to be retained and mature trees over 20 m may be trimmed if necessary for safety and operational requirements.	Scouting. Design Criteria.	Section 7	Pre works
Appendix 4	C52	Direct impact to watercourses by transmission towers will be avoided by implementing buffer distances and sighting towers so the alignment can completely span waterways. No towers will be located within a watercourse or its riparian zone.	Scouting. Design Criteria.	Section 7	Pre works
Appendix 4	C53	Micro-siting of towers will occur to avoid key localised ecological resources such breeding, nesting or refuge sites for conservation significant species including but not limited to the black-throated finch (southern), squatter pigeon(southern), Julia Creek dunnart, ornamental snake, greater glider and koala.	Scouting. Design Criteria.	Section 7	Pre works
Appendix 4	C54	In areas of importance for conservation significant species where high levels of fauna connectivity is unavoidably impacted, retention of remnant vegetation strips will be considered to maintain connectivity and reduce habitat fragmentation / isolation. This will be undertaken in areas where the vegetation strips will not impact the operational safety of the network infrastructure.	Design criteria.	Section 7	Pre works
Appendix 4	C55	Temporary and permanent structures and infrastructure will be located in areas of non-remnant or least concern vegetation to minimise clearing of high value vegetation (in particular of concern)	Scouting. Design Criteria.	Section 7	Pre works
Appendix 4	C56	A Flora and Fauna Management Plan will be developed prior to construction commencing. The Flora and Fauna Management Plan will include details relevant to the general management of flora and fauna impacts as well as Species Management Plans for identified conservation significant species that will be impacted. Where necessary, the Flora and Fauna Management Plan will incorporate flora and fauna monitoring activities. Specifically, ongoing monitoring and survey requirements necessary to assess the persistence and health of conservation significant populations will be outlined (i.e.EVNT flora and fauna species impacted by the Project). For more information on the flora and fauna management plan, refer toVolume3 Appendix O Environmental management plan.	Flora and fauna management - various	Section 18.4 Section 18.5	Pre and during works
Appendix 4	C57	The Construction Environmental Management Plan will include rehabilitation measures for areas to be temporarily disturbed during construction will be developed prior to construction commencing with the overall aim of minimising the amount of land disturbed at any one time during the construction of the Project. As soon as practicable after cleared areas are no longer required (i.e. temporary construction camps, laydown areas, quarries, borrows, turning circles and access tracks), rehabilitation will commence. Temporary construction infrastructure will be decommissioned and removed from site. The sites will then be rehabilitated. Rehabilitation measures will include: Removal of potentially hazardous stored substances Remediation of any contaminated areas Grading of disturbed surface to a state generally consistent with a natural topography (if required) and to ensure that permanent drainage lines are not compromised Application of topsoil and revegetation with species adapted to the site. Requirements and mechanisms for post-construction monitoring of rehabilitation success. Certain vegetation cleared during construction may be chipped or mulched and used in the rehabilitation of erosion prone areas. Any temporary watercourse crossings will be rehabilitated to a similar profile to minimise flood erosion risks. The Construction Environmental Management Plan include procedures for revegetation species selection, ground preparation and sowing/planting.	CEMP - Rehabilitation Management Plan.	Section 18.1	Pre works
Appendix 4	C58	The corridor selection will be located to avoid disturbances within sensitive areas mapped as wetlands and semi-evergreen vine thicket.	Design criteria.	Section 7	Pre works

Section	Commitment	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 4	C59	A Construction Environmental Management Plan which includes weed and pest management measures will be developed prior to construction commencing. The plan will include details relating to the monitoring, management and, where necessary, treatment of weeds, disposal of green waste, and vehicle/plant weed washdown protocols.	Biosecurity management plan	Section 18.3	Pre works
Appendix 4	C60	Pre-clearance surveys will be undertaken during the detailed design phase within known and potential habitat areas of conservation significant species and within significant communities such as Of Concern REs and Essential Habitat in order to plan infrastructure placement, tower heights, spans and resulting clearing to avoid known occurrences and habitat for conservation significant species.	Pre-clearance surveys scope	Section 7 Section 18.4	Pre works
Appendix 4	C61	The extent of vegetation clearing (and no-go areas) will be clearly identified on construction plans and in the field using high visibility fencing or flagging in the vicinity of high conservation significant areas. Clearing extent will be communicated to construction supervisors.	Vegetation demarcation.	Section 18.4	Pre and during works
Appendix 4	C62	Where infrastructure must cross waterways, areas of existing disturbance (i.e. existing tracks or clearing) will be used. Where this is not practicable, the Project footprint will be minimised and the stumps of large habitat trees retained. Waterway crossings in known habitat for conservation significant flora and fauna species will aim to avoid occurrences of conservation significant flora species. Transmission lines will span across the riparian habitat corridors wherever possible.	Design criteria.	Section 7	Pre works
Appendix 4	C63	A CEMP will be prepared and implemented for standards such as weed hygiene, erosion, fuels and hazardous substances, fire, etc. The CEMP will include protocols to limit injury and mortality to fauna including management of risks associated with open excavations, trenching, waterbodies and responses and reporting for roadkill and adverse incident protocols	CEMP aspects for inclusion.	Section 18.1-18.11	pre works
Appendix 4	C64	A Traffic Management Plan will be developed for the construction site with designated access routes, speed limits and sensitive ecological areas (i.e. Particularly areas where squatter pigeons have the potential to occur on access roads).	Not addressed by this Plan.	NA	
Appendix 4	C65	Erosion and sediment control measures will be developed as part of the CEMP for the Project.	CESCP and P-CESCPs	Section 18.1	Pre works
Appendix 4	C66	A Waste management procedure will be prepared as part of the CEMP. These will detail the location and specifications for disposal and removal of waste from the construction site. Responsible waste management practices (e.g. not leaving out food waste and not feeding wildlife) will be implemented and followed by all construction personnel. All waste will be stored in secure temporary holding containers and transported offsite.	Waste management.	Section 18.10	Pre works
Appendix 4	C67	Management strategies with reference to biosecurity will be developed to reflect the level of risk proposed for Project activities and Project work fronts.	Biosecurity management plan	Section 18.3	Pre works
Appendix 4	C68	All relevant personnel working in the field on the Project will receive an induction regarding biosecurity matters and management requirements relevant to their specific work activities and Project work front.	Prepare site induction	Section 12.3	Pre works
Appendix 4	C69	A weed and pest biosecurity survey will be undertaken over of the corridor selection within six months of construction commencing in that section.	Weed baseline survey	Section 18.3	During works
Appendix 4	C70	The Construction Contractor(s) will undertake a detailed assessment of biosecurity risks associated with specific work activities and construction methods	Risk assessment	Section 6 Section 18.3	During works
Appendix 4	C71	Prior to leaving their point of origin for access to the Project site, all vehicles, plant, equipment and machinery shall be cleaned down and be accompanied by a current and certified Biosecurity Declaration Form from the entity responsible for the clean down.	Require a washdown bay at all property exits	Section 18.3	During works
Appendix 4	C72	PQ will develop and implement a movement control plan and species specific biosecurity treatment procedures.	Biosecurity management plan	Section 18.3	During works
Appendix 4	C73	Biosecurity will be managed in accordance with the Construction Environment Management Plan, Prior to leaving a Project work front, or moving between Project work fronts or biosecurity risk areas, all vehicles, plant, equipment and machinery shall undergo clean down at designated facilities and a new Biosecurity Declaration Form completed. Any specific landholder requirements will also be noted apart of the clean down requirements.	Biosecurity management plan	Section 18.3	Pre and during works
Appendix 4	C74	Access tracks, stockpiles, and laydown/delivery areas will be located as far as practicable away from important wetlands, waterways and drainage lines.	Design criteria Water management	Section 18.2	Pre and during works
Appendix 4	C75	Taller transmission line structures will be employed near waterways to ensure that spanning of riparian vegetation is achieved where practicable and disturbance is minimised.	Design criteria vegetation management	Section 7	Pre works
Appendix 4	C76	Riparian vegetation will be retained where practicable to maintain waterway bank stability.	Waterway assessments	Section 7	Pre works

Section	Commitment	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 4	C77	Ground disturbance will be minimised wherever practical by using existing cleared areas for construction laydown/delivery areas and material stockpiles.	Design criteria Scouting	Section 7	Pre works
Appendix 4	C78	All disturbed areas will be rehabilitated as soon as practicable in order to establish ground cover and limit the duration that disturbed ground surfaces are exposed to erosive processes.	ESCP	Section 18.1	During works
Appendix 4	C79	A construction Water Plan will be developed during the detailed design phase with consultation of Department of Regional Development, Manufacturing and Water (DRDMW).This plan will include all sources of taking water, identifying locations where water will be acquired from, amount of water (outlining maximum limits), locations of potential water interference, and any new or modified works that will capture overland flow for construction purpose sand associated approvals. Water resource objectives and mitigation controls during the project will be outlined in the Water Plan as well as being in accordance with the Framework MP.	Activity specific plan	Section 18.2	Pre works
Appendix 4	C80	Careful consideration of site constraints and placement of towers and associated infrastructure to avoid/minimise direct disturbance to water features.	Design criteria Scouting	Section 7	Pre works
Appendix 4	C81	Waterway crossings the Project traverses will be identified as waterway barrier works, and existing access track swill be utilised wherever possible for access to the Project and when crossing waterways comply with DAF Accepted development requirements for operational work that is constructing or raising waterway barrier works.	Design criteria Water management	Section 7 Section 18.2	Pre and during works
Appendix 4	C82	Use existing licensed and authorised sources of construction material (e.g. aggregate) from local suppliers.	Quarry resources	Section 18.1	Pre works
Appendix 4	C83	Implement best practice erosion and sediment controls during construction.	ESCP	Section 18.1	During works
Appendix 4	C84	Design temporary and permanent infrastructure with industry standard stormwater management controls	Stormwater/hydraulic design	Related document	Pre works
Appendix 4	C85	Locate permanent infrastructure away from flood prone areas where practicable or provide appropriate flood immunity in accordance with design requirements.	Design criteria	Section 7	Pre works
Appendix 4	C86	Utilise existing licenced and authorised water sources during construction in consultation with Council, DNRME and landholders	Activity specific plan	Section 18.2	Pre works
Appendix 4	C87	Transport, store, use and dispose potentially contaminating substances in accordance with manufactures specifications, legislative requirements and industry best practice	Hazardous materials management	Section 18.10	During works
Appendix 4	C88	Design, construct, operate and decommission STPs in accordance with manufactures specifications, legislative requirements and industry best practice.	Activity specific plan	Section 18.10	Pre and during works
Appendix 4	C89	During the project design and preconstruction phase, waterway assessments (in addition to those already undertaken during the EIS Phase) will be undertaken that will capture on ground physical and hydrological fish habitat attributes to confirm whether a particular drainage or waterway feature is a defined waterway that provides for fish passage. Theses assessment will be undertaken we reference to the attributes that define a waterway as described in the DAF factsheet 'what is a waterway' (DAF,2017). A pre-lodgment meeting with DAF to assist in the determination of potential waterway barrier works that might be triggered as part of the project. Where the project requires crossing works within a DAF waterway and those works cannot meet the ADR a development approval will be obtained for waterway barrier works prior to commencement of construction in the waterway.	Waterway assessments	Section 7 Section 3.3 - approval strategy Section 18.2	Pre works
Appendix 4	C90	PQ will consider implementation of the following mitigation opportunities for the management of air quality: Development of dust and stockpile management procedures within the Environmental Management Plan. Undertake progressive rehabilitation and stabilisation of disturbed areas in accordance with a rehabilitation plan. Maintain a complaints register for the management and tracking of complaints. Development of a Greenhouse gas offset plan.	Air quality management	Section 18.7 Section 18.1 Section 11.4 Section 18.7	Pre and during works
Appendix 4	C91	PQ will consider implementation of mitigation measures to reduce the production of greenhouse gases with regards to fuel c combustion and gas-insulated electrical components. Offset strategies will also include the development of a GHG Offset Plan and consideration of options regarding Green Power sources from a renewable source or contributions to another credited offset program. This strategy will depend on Federal and State climate change policy current at the time the Project is approved.	Air quality management	Section 18.7	Pre and during works
Appendix 4	C92	Traffic Control Plans will be prepared immediately prior to construction by the Construction Contractor which will illustrate the access routes to the site for points along the corridor's election.	Not addressed by this Plan	NA	
Appendix 4	C93	Targeted landholder communication will be conducted prior to especially noisy activities such as blasting activities (if required) and helicopter (aerial) stringing of lines.	Refer to the Stakeholder Management Plan.	Section 15.8	Pre and during works

Section	Commitment	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 4	C94	A complaints register will be maintained. Should non-vexatious noise complaints be received, noise monitoring may be undertaken at the locations concerned. Reasonable and feasible measures will be implemented to reduce noise impacts.	Complaint management	Section 11.4	During works
Appendix 4	C95	Waste will be dealt with following the waste management hierarchy, where avoidance of waste generation is the most desirable course of action and disposal of waste is the least desirable course of action.	Waste management.	Section 18.10	Pre and during works
Appendix 4	C96	Waste generation will primarily be mitigated and managed by reducing (avoiding), recycling and reusing. All waste is expected to be transported to external licensed waste management facilities; these will be determined during the MID process.	Waste management.	Section 18.10	Pre and during works
Appendix 4	C97	Waste management procedures will be prepared as part of the CEMP that will include specific measures for storing, transporting and disposing of wastes developed in consultation with operators of local waste management facilities	Waste management.	Section 18.10	Pre works
Appendix 4	C98	Where necessary, restricted invasive plants material will be disposed in accordance with the biosecurity measures in the CEMP.	Biosecurity management plan	Section 18.3	Pre works
Appendix 4	C99	During construction, traffic impacts will be managed in accordance with the mitigation measures outlined in the Traffic management plan.	Related Plan	NA	
Appendix 4	C100	A Traffic management plan will be developed for the Project by the haulage contractor and will include consultation with the relevant transport authorities (including DTMR, QR and local councils). This plan will include a detailed rail impact assessment, supplied to Queensland Rail detailing the traffic volumes expected to traverse level rail crossings, the frequency and period of operation. This will include peak traffic volumes, such as daily workforce movements in addition to heavy, over dimensional vehicles that will cross rail structures including level crossings.	Not addressed by this Plan	NA	
Appendix 4	C101	A Road Use and Traffic management plans will be developed for the Project and will include consultation with the relevant transport authorities, such as DTMR, Queensland Rail, Department of Education, and local government councils.	Not addressed by this Plan	NA	
Appendix 4	C102	PQ and their technical service partners and Construction Contractors are committed to obtaining all relevant approvals, including all necessary environmental approvals, prior to the commencement of construction and complying with all required approvals for the Project.	Approval Strategy/RAP	Section 3.3	Pre works
Appendix 4	C103	A Traffic Impact Assessment (TIA) which complies with the Department of Transport and Main Roads' Guide to Traffic Impact Assessment to the Department of Transport and Main Roads will be provided at the beginning of the project's subsequent approval (currently anticipated to be a request for Ministerial Infrastructure Designation). Detailing additional information on design of road crossings in accordance with DTMR requirements.	Not addressed by this Plan	NA	
Appendix 4	C104	Opportunities for integration of the workforce into local communities may be identified through meetings between a representative of the Construction Contractor and the local council and chamber of commerce within the regional community hubs to manage or alleviate any positive or negative interactions between the Project work forces and the community. These meetings will occur in accordance with consultation strategies and protocols and will involve regional development organisations for future project development/participation opportunities.	Not addressed by this Plan	NA	
Appendix 4	C105	PQ will consider all Project design processes available to reduce the consequences of potential social impacts. These include the location of construction camps and location of laydown areas and concrete batching plants.	Design Criteria - amenity	Section 7 Section 15.8	Pre works
Appendix 4	C106	It is PQ's strong preference that a voluntary and commercial agreement is reached with landholders in the acquisition of an interest (easement) required for the Project. This process will follow detailed land access negotiations with landholders regarding the possible alignment for the corridor selection and other specific issues regarding current and future land uses or operations.	Not addressed by this Plan	NA	
Appendix 4	C107	The land access management plan will identify agreed access arrangements during construction and operation, rehabilitation requirements after construction and communication arrangements for each property.	Staged rehabilitation plans	Section 18.1	Pre and during works
Appendix 4	C108	A community and stakeholder engagement plan will guide engagement with stakeholders during construction of the Project. The plan will act as a key mechanism to foster dialogue with communities and stakeholders and manage and monitor potential social impacts and opportunities of the Project. The Plan will include: Identification of key stakeholders Key messages Engagement methods and activities Complaints management procedure.	Refer to the Stakeholder and Engagement Management Plan.	Section 11	Pre and during works

Section	Commitment	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 4	C109	The Workforce management plan will include a: Training and education program that will maximise employment including indigenous employment and train indigenous and non-indigenous workers who require additional qualifications to work on the Project. Code of conduct that describes the expected standard of behaviour for all personnel (construction and operation). Measures to develop a strong mental health culture and promote wellbeing within the workforce.	Not addressed by this Plan	NA	
Appendix 4	C110	The local and Indigenous business participation plan will maximise opportunities for local and Indigenous businesses though relationships with local businesses, suppliers and key stakeholders and giving preference to local, regional and Indigenous-owned businesses in tendering evaluation.	Not addressed by this Plan	NA	
Appendix 4	C111	Agreeing and executing a Cultural Heritage Management Plans (CHMP) with each Aboriginal party to identify a clear process for managing Aboriginal cultural heritage, including cultural heritage survey and management processes. Ongoing engagement with local Aboriginal and Torres Strait Islander Organisation and Groups will be in accordance with developed CHMP's. The mitigation measures included within the CHMPs will be comprehensive and entail a number of possible procedures that will include (but not be limited to): In the first instance, avoiding Indigenous cultural heritage, wherever practical Carrying out further detailed field investigations Collecting and relocating cultural heritage items, as agreed with the relevant Aboriginal parties	Cultural heritage	Section 18.8	Pre works
Appendix 4	C112	Inform personnel and contractors of the appropriate measures to adopt in the event of the discovery of an archaeological artefact	Unexpected finds procedure	Section 18.8	Pre and during works
Appendix 4	C113	PQ will develop and implement an unexpected finds procedure as part of the CEMP with procedures for stopping work in the event of the discovery of an archaeological artefact until a suitably qualified cultural heritage practitioner can assess the item/site and follow a processor identification and recording. In addition, all contractors will be required to undergo cultural heritage inductions to ensure awareness of obligations in preserving significant cultural heritage. The inclusion of cultural heritage awareness training in inductions and procedures for managing archaeological finds in the construction environmental management plan.	Unexpected finds procedure	Section 18.8 Section 12.3	Pre and during works
Appendix 4	C114	Requirements outlined by the Qld Heritage Act 1992(section 89) will be followed when reporting and managing non-indigenous cultural heritage finds.	Unexpected finds procedure	Section 18.8	During works
Appendix 4	C115	The Project will include a Training Policy and an Indigenous Economic Opportunities Plan to ensure maximise local employment, training and business supply opportunities for Aboriginal and Torres Strait Islander Queenslanders.	Not addressed by this Plan	NA	
Appendix 4	C116	PQ will aim for at least 15 percent of the total man-hours to be undertaken by apprentices and/or trainees and through other workforce training. Head office and administration roles will work Monday to Friday to minimise staff upload costs associated with weekend work and to attract local workers.	Not addressed by this Plan	NA	
Appendix 4	C117	Across all aspects of the Project, PQ will strive to include members of Indigenous communities and people with a disability. Skills assessment and recruitment and training programs will be offered. Refer to Local and Indigenous Employment, Engagement and Training Plan (Volume 4 EIS Supplement, Attachment I)	Not addressed by this Plan	NA	
Appendix 4	C118	As the Project is based in a regional area and travel will include off road driving, vehicle operation training will be a pre-requisite for some site-based workers and sub-contractors.	refer to Safety Management Plan	NA	
Appendix 4	C119	PQ envisages that the admin, camp cleaning/kitchen hand roles will be filled by local people and businesses. Employees will be given training and develop new skills in reception, administration, cost control systems and software packages as required.		NA	
Appendix 4	C120	The following training programs will take place: Suitable numbers of people on site will be first aid officers. The number will depend on the crew size for each work front. Training and development programs will be offered to office staff, administrators as well as site engineers and supervisors		Refer to Section 12.3 for environmental training cohort.	Pre and during works

Section	Commitment	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 4	C121	The Project will engage the following high-level strategies to operationalise this policy: Recognise that involving local industry in projects provides economic benefits to all parties. Ensure that Queensland and Australian suppliers, contractors and manufacturers are given full, fair and reasonable opportunity to tender and participate in all stages of the Project. Use Australian standards and codes in the formulation of specifications, tenders and the letting of contracts(except where it is unreasonable to do so). Seek to maximise levels of goods and services, including design services, from local companies where they are competitive with respect to cost, quality and timeliness. Seek to incorporate the Queensland Charter for Local Content into contracts entered into with third parties for the supply of goods and services. Encourage private sector project proponents, who are not formally subject to the provisions of the policy, to apply the principles espoused in the policy to their projects on a voluntary basis as 'good corporate citizens'.	Not addressed by this Plan	NA	
Appendix 4	C122	A Road Use Management Plan (RUMP) should be prepared to address the increase of traffic on local roads and highways during construction. This will include but is not limited to details about movements of heavy vehicles, school zone impacts including school bus routes, impacts to access to state-owned forest products / commercial timber/quarry material, transport of construction workers, and details regarding access to transmission line easements.	Not addressed by this Plan	Section 18.1 identifies environmental inputs	Pre works
Appendix 4	C123	The hazards and risks identified during the risk assessment process will be maintained within a risk register that is continually updated and relevant. The risk register will be reviewed at least annually to ensure that high level hazards and risks continue to be adequately controlled.	Environmental risk assessment	Section 6	Pre and during works
Appendix 4	C124	PQ will develop and implement a Risk Management Plan which will include, but not be limited to the following: Application of Design and Construction Standards Safety in Design Reviews Construction Safety Management Plans Construction Environmental Management Plans Construction Quality Management Plans Operational Safety Management Systems Operational Environmental Management Plans Asset Management Strategy and Plans Bushfire Management Plan Emergency Response Planning Stakeholder Communications and Engagement Plan.	Environmental risk assessment	This CEMP for environmental risks	Pre works
Appendix 4	C125	The RUMP will be developed in consultation with DTMR and local government councils. Contractors will develop and implement specific plans for oversized loads.	Not addressed by this Plan	Related document Section 18.1 identifies environmental inputs	Pre works
Appendix 4	C126	Development of environmental and safe work methods (ESWMS) in accordance with industry best practice to minimise the risk of exposure to electrified equipment during the operation of the Project. The Queensland Electrical Safety Office (ESO)and Energy Networks Australia (ENA) have separately published a number of guidelines and codes that will be adopted to minimise the risk to personnel. These include: Australian Standard AS5804 (Series) High-voltage live working Electrical safety code of practice 2013-Managing electrical risks in the workplace Electrical safety code of practice 2020-Working near overhead and underground electric lines Electricity safety codes of practice 2020–Works National Electricity Network Safety Code(ENADOC001-2019) ENA Guidelines for Safe Vegetation Management(ENADOC023-2009) ENA National Guideline for Mobile Plant Earthing(ENADOC031-2011) Vegetation Risk Management for Overhead Electricity Networks–Guideline (ENADOC038-2018) National Guidelines for Manual Reclosing of High Voltage Electrical Apparatus Following a Fault Operation (Manual Reclose Guidelines) (ENADOC 042-2018) National guidelines for safe approach distances to electrical and mechanical apparatus(ENANENS04-2006) National guidelines for the selection, use and maintenance of personal protective equipment (PPE) for electrical arc hazards(ENANENS09-2014).	Standard/specification	NA	
Appendix 4	C127	A register of all hazardous materials will be kept updated including relevant safety data sheets for each substance. Appropriate training will be provided including methods for handling, storage and clean-up of hazardous substance and chemical spills. Applicable PPE will be provided.	Chemwatch	Section 18.9	Pre and during works
Appendix 4	C128	Substations will be designed in accordance with relevant Australian Standards for the prevention of fire and explosion hazards. Automatic electrical protection systems and separation distances of transformers from buildings will minimise the risk of explosion or fire.	Not addressed by this Plan	NA	

Section	Commitment	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 4	C129	All personnel conducting aerial work must have the required accreditations. Specific ESWMS will be developed for each activity involving aerial work. Aerial inspection of the transmission line will be in accordance with the principles of the National guidelines for aerial surveillance of overhead electricity networks (ENANENS08-2006).	Not addressed by this Plan	NA	
Appendix 4	C130	Standard policies on vehicle use and driver safety (such as speed limits, seat belt requirements, vehicle maintenance and zero drug and alcohol limits will be implemented.	Fauna strikes, amenity, contamination	Section 18.5 Health and Safety Implementation Plan	During works
Appendix 4	C131	The prevention of aircraft contact with the transmission infrastructure will incorporate: Ongoing landholder consultation on the location of the transmission lines Utilisation of transmission line identification markers in areas of aircraft use, in accordancewithAS3891.1–2008 Recording of the transmission line on navigation mapping in conjunction with CASA, Air Services Australia and Royal Australian Air Force–Aero nautical Information Service Ensuring PQ personnel conducting aerial activities are accredited to do so and operate in accordance with the ESWMS and fatigue management plans under the Operational Safety Management System Advising the electricity entities of the location of the transmission line infrastructure Encouraging private aircraft operators to conduct fixed wing aerial mustering in accordance with the techniques identified in the Aerial Mustering Code of Practice (Pastoralists and Graziers Association of Western Australia,2003).	Not addressed by this Plan	NA	
Appendix 4	C132	PQ commits to undertaking further consultation with landholders regarding the safety of aerial work operations.	Refer to Stakeholder Management Plan.	NA	
Appendix 4	C133	PQ will conduct detailed Safety in Design Reviews of each major Project component. These reviews are intended to confirm that risk mitigation (safety, environment, operational) is incorporated into the Project design and to identify opportunities for improvement where potential gaps are identified.	Environment in design	Section 7	Pre works (per stage)
Appendix 4	C134	The use and storage of hazardous materials will be accordance with current Australian Standards and industry codes of practice. Where available, provisions will be made to include licences and compliance with all associated conditions to ensure the level of risk is minimised.	Standard/specification	Section 18.9	During works
Appendix 4	C135	The Construction EMP will include a safety management sub plan, which will be generated on the basis of a Construction Risk Assessment. The risk assessment will involve a cross section of the construction workforce, in accordance with best practice risk management principles. Ongoing supervision will be provided to ensure compliance with the Safety Management Plan.	Refer to existing/separable Health and Safety Management Plan.	NA	
Appendix 4	C136	A Construction EMP will be prepared to address the environmental management strategies including performance criteria, management actions and monitoring, auditing and reporting requirements and to specify areas of responsibility related to the construction phase of the Project.	This Plan. Implement requirements.	Sections 18.1-18.11	Pre and during works
Appendix 4	C137	A construction Quality Management Plan will ensure that the construction of the Project, including the risk mitigation factors, is delivered in accordance with the prescribed specification. It will include detailed audits and reviews at pre-determined hold points in a gated approach.	Related Plan	NA	
Appendix 4	C138	An Operational EMP will be prepared to provide specific environmental management requirements to ensure that operational activities have minimal adverse effects on the environment and surrounding community.	Not addressed by this Plan.	NA	
Appendix 4	C139	An overall asset management strategy will be developed, and this will be supported with management plans focusing on such aspects as condition monitoring and preventative maintenance, corrective maintenance, asset replacement and augmentation, change management, etc. Formal policies and standards will be developed based on asset life considerations and standard operating procedures will be developed to ensure that these policies and standards are delivered. Where appropriate, replacement infrastructure will be provided where necessary (new fences and gates, culverts or signage) to mitigate impacts on access and infrastructure to the affected properties.	Not addressed by this Plan.	NA	
Appendix 4	C140	A Bushfire Management Plan will be developed and will consider both network design and operating features relevant to fire prevention, as well as environmental procedures, such as vegetation management, to manage and mitigate the potential consequences of an ignition.	Technical Sub Plan	Section 18.	Pre works
Appendix 4	C141	Formal procedures will be developed to ensure that there are adequate resources to respond to community concerns such as network operations issues, traffic management, environmental issues and outline landholder communication protocols and project updates.	Refer to the Stakeholder Management Plan.	NA	
Appendix 4	C142	PQ will maintain a state of emergency preparedness as a commitment to its workforce, local communities and other relevant stakeholders. A detailed Emergency Management Plan will be developed for the Project that details emergency response procedures should an emergency situation arise.	Not addressed by this Plan.	NA	

Section	Commitment	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 4	C143	Standard policies on vehicle use and driver safety (such as speed limits, seat belt requirements, vehicle maintenance and zero drug and alcohol limits will be implemented.	Not addressed by this Plan.	NA	
Appendix 4	C144	PQ will develop a structured health and safety management system for construction and operation of the Project in accordance with AS 5577-2013 and AS/NZS 4801-2001: Occupational health and safety management systems, which includes policies, objectives and procedures for ensuring the health and safety of personnel, the community and other associated stakeholders.	Related Plan	NA	
Appendix 4	C145	Training and health and safety updates will be provided to personnel and contractors where appropriate, through regular toolbox talks. Personnel trained in first aid will be present on site at all times and approximately 20 percent of the workforce will have formal first aid qualifications.	Not addressed by this Plan.	NA	
Appendix 4	C146	The Emergency Management Plan will be developed in consultation with the relevant emergency service providers including the Department of Community Safety (which includes the Queensland Ambulance Service, Queensland Fire and Rescue Service, Rural Fire Service and Emergency Management Queensland), local government councils and other relevant community stakeholders. The Emergency Management Plan will include reference to the State Planning Policy, Mitigating the Adverse Impacts of Flood, Bushfire and Landslide and local government disaster management plans, where appropriate. Emergency service providers will be updated on amendments and revisions to the management plan, where appropriate.	Refer to Stakeholder Management Plan.	NA	
Appendix 4	C147	The Emergency Management Plan and emergency response procedures will be communicated to all personnel associated with the Project through inductions and toolbox talks. Copies of the Emergency Management Plan will berequiredtobekeptinprominentworkplacelocationsandwillbemadeavailableonsiteduringconstruction.	Related Plan	NA	
Appendix 4	C148	The Emergency Management Plan will be developed in consultation with relevant interested parties and include measures to manage operational responses to risks associated with hazards that have a broader impact e.g. bush fires and flash overs	Related Plan	NA	
Appendix 4	C149	The corridor selection will avoid environmentally sensitive areas when determining the corridor detailed design.	Design criteria	Section 7	Pre works
Appendix 4	C150	All potential environmental impacts of the Project have been assessed and comprehensive management plans have been developed to manage potential impacts.	Refer to environmental management framework	Section 3.4	Pre and during works
Appendix 4	C151	An adaptive management and monitoring protocol will be developed and included in the Flora and Fauna management plan to monitor the ongoing impacts during the life of the Project.	Flora and Fauna management plan	Section 7 Section 18.4	Pre and during works
Appendix 4	C152	The Project will aim to mitigate potential environmental impacts through design criteria and industry standard management measures.	Environment in design	Section 7	Pre works
Appendix 4	C153a	As part of the Project various overarching management plans will be developed and implemented in relation to the broader environmental aspects for the Project Accommodation Management Plan Community Liaison Management Plan Construction Methodology Management Plan Helicopter Stringing Management Plan Interface Management Plan Local and Indigenous Employment, Engagement and Training Plan Local Industry Participation Plan Procurement and Logistics Management Plan Sustainability Management Plan Waste and Refuse Disposal Management Plan Biosecurity Management Plan Community and Stakeholder engagement plan Field development plan Land Access Management Plan Rehabilitation plan Regulatory Approvals Plan Species specific management plan Social impact management plan	Refer to environmental management framework	Section 3.4 Section 7 Not Addressed: Social Impact MP Community Liaison MP Construction Methodology Local Participation Procurement. Section 15 identifies Implementation measures for integration into the Construction Methodology MP and Procurement MPs. Section 14 includes sustainability requirements.	During works

Section	Commitment	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 4	C153b	As part of the Construction Environmental Management Plan, various sub-plans will be developed and implemented in relation to the environmental aspects for the Project Air Quality (Dust) Management Biosecurity Management Contaminated land Cultural &European Heritage Management Erosion and Sediment Control Flora & Vegetation Management Fauna Management Hazards, Health and Safety Management Plan, including hazardous substance register Noise and Vibration Management Waste Management Water Quality Management Plan, including stormwater controls and drainage measures	CEMP aspects for inclusion	This Plan	Pre and during works
Appendix 4	C153c	As part of the Operational Environmental Management Plan, various sub-plans will be developed and implemented in relation to the environmental aspects for the Project Air Quality (Dust)Management Plan Biosecurity Management Contaminated Land Management Plan Erosion and Sediment Control Management Plan Fauna Management Plan Flora and Vegetation Management Plan Hazards, Health and Safety Management Plan, including hazardous substance register Noise and Vibration Management Plan Waste Management Plan Water Quality Management Plan, including stormwater controls	Not addressed by this Plan	NA	
Appendix 4	C154	Key components that will be integrated into the management plans are outline of the potential impacts and the details of the specific mitigation measures including those discussed in the EIS documentation. The roles and responsibilities for who will be implementing the plan and the monitoring and reporting requirements will be included to act as a guide on site. Relevant stakeholders will be engaged as necessary as part of the development of these plans.	Refer to Stakeholder Management Plan.	Appendix A for cross referencing Section 5	Pre works
Appendix 4	C155	The components of the environmental management plan will include: Environment and Sustainability Policy Planning, objectives and legal obligations Resources, roles, responsibilities and authorities Competence, training and awareness Communication, consultation and involvement Documentation, document control and records Operational controls Emergency preparedness and response Monitoring, inspections and audits Incident management Complaints management Non-conformity, corrective action and preventative action Environmental reporting Management review and continuous improvement.		This Plan (see contents table)	Pre works
Appendix 4	C156	PQ will develop and implement an environmental management plan for construction and operation The Construction MP and EMP (Operation) will set out a detailed procedure for managing environmental impacts during the construction and operation of the Project respectively and will be developed in accordance with the objectives, performance criteria, management measures and monitoring requirements stipulated in the Project Framework EMP. The Construction EMP and EMP (Operation) will also incorporate the approval conditions issued for the Project and any relevant commitments made by PQ in the EIS.		This Plan	Pre and during works
Appendix 4	C157	PQ will engage with relevant state and commonwealth agencies in the development of environmental management plans	Stakeholder management plan	CEMP and various Sub Plans required to be submitted to agencies as per conditions.	Pre works

Section	Commitment	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 4	C158	PQ is committed to ensuring that: Environmental harm and pollution is minimised through the active identification and management of environmental risks; Ensuring the efficient use of resources, recycling of materials and reduction of waste; Compliance is maintained with relevant environmental legislation, regulation and standards as well as project approval conditions; An environmental management system is implemented that is developed in accordance with AS/NZS ISO 14001;and Regular review and analysis of environmental performance is undertaken to identify and implement continual improvement	EMP objectives	Sections 1-17	Pre and during works
Appendix 4	C159	PQ will ensure that the Construction Contractor's environmental record and policy aligns with PQ corporate values to achieve compliance with legislation and approved conditions.	Procurement/subcontractor management	Section 1 Appendix B Enforcement information available	Pre works
Appendix 4	C160	Employees and contractors will undergo site inductions and training relating to environmental management in accordance with the EMP documentation	Environmental training	Section 12	Pre and during works
Appendix 4	C161	The EMP will include the development and implementation of a grievance and dispute resolution procedure to ensure any complaints from landholders and other stakeholders are managed effectively and efficiently. Where necessary, this may include monitoring or changes to environmental management plans and procedures	Complaint management	Section 11.3	Pre works
Appendix 4	C162	The EMS framework will facilitate continual improvement in performance by the review and, where necessary, revision of the environmental management plans, procedures and monitoring.	EMP reviews	Section 16	During works
Appendix 4	C163	Where ecological surveys have currently not been completed, ecological surveys will be completed prior to clearing to confirm the RE status and conservation significant habitat quality and condition in comparison to desktop mapping.	Pre-clearance surveys scope	Section 18.4	Pre works (per stage)
Appendix 4	C164	The proposed mitigations are existing commitments within the EIS which are considered to be adequate to also mitigate the cumulative effects of other projects: Direct impact to areas of high ecological value will be minimised through the process of corridor realignments or spanned across wherever possible using higher towers as appropriate to the ecological values and the terrain constraints. A Road Use Management Plan (RUMP)and a Traffic Management Plan will be developed for the Project and will include consultation with the relevant transport authorities such as DTMR, Queensland Rail and local government councils. Prior to leaving a Project work front, or moving between Project properties ,work fronts or biosecurity risk areas, all vehicles, plant, equipment and machinery shall undergo clean down.	EMP operational controls - various	Section 7 Section 18.3 Section 18.10	Pre and during works
Appendix 4	C165	Where offsets are required under approval conditions an Offset Management Plan will be prepared in accordance with the Biodiversity Offsets Management Strategy prepared for the project.	Not addressed by this Plan.	NA	Client
Appendix 4	C166	Should apiarists consider placement of beehives inside the easement, advice on suitable techniques to shied beehives from electric field generated by the transmission line will be provided.	Not addressed by this Plan	NA	Client
Appendix 4	C167	Particular mitigation measures that are to be included in the design of the transmission infrastructure include: Voltage balancing of the transmission lines by phase transposition. Designing the transmission network to operate remotely from a central control centre, limiting the occupational exposure to times of repair or maintenance. Restricting access to the substation sites by use of security fencing. This will limit the exposure of the general public to higher fields within the substation.	Not addressed by this Plan	NA	
Appendix 4	C168	PQ recognises that electrical and magnetic fields (EMF) is an issue of great importance to local communities and nearby residents. PQ as part of the Stakeholder and Community Engagement Plan will endeavour to: Remain up-to-date with the latest scientific research into possible linkages between EMF and adverse health impacts; Liaise closely with the community to ensure they are educated and informed of emerging research and EMF policy development; and Encourage concerned stakeholders to liaise with independent organisations in relation to EMF and transmission infrastructure (i.e. ARPANSA).	Not addressed by this Plan	NA	

Section	Commitment	Requirement	Task/Action	CEMP Cross Reference	Trigger (Pre works, During works)
Appendix 5	Micro-siting	Nonlinear infrastructure (includes all temporary construction activities, pads, substations etc.. Must be located outside of the following areas: - 25m from toe of bank of moderate risk waterway for a transmission tower - 50m from defined bank of a high risk waterway for a transmission tower (excluding crossing large braided ephemeral systems/flood plains more than 1km wide - 75m from defined bank of major waterway for a transmission tower (as above) - 20m for areas containing: regulated vegetation within 100m of a wetland or HES wetland - 25m from any regulated vegetation - Cat B - 25m from any regulated vegetation - Cat R - 10m from base of any rock outcrop/jump up/gilgai confirmed to be habitat value for protected species	Design criteria	Section 7	Pre works
Appendix 5	Micro-siting	Linear infrastructure (tracks and line of sight clearing) - access track clearing max 6m wide - access to watercourse crossings is perpendicular to banks outside of: - regulated vegetation within 100m of a wetland - HES wetland - Regulated vegetation - cat B - Regulated vegetation - Cat R - 10m from base of any rock outcrop/jump up/gilgai confirmed to be habitat value for protected species	Design criteria	Section 7	Pre works

Appendix B Environmental Policy and EMS Certification

UGL

ENVIRONMENT POLICY

UGL recognises the importance of environmental conservation and sustainability. We understand the importance of conducting our operations and delivering products and services with the highest standard of environmental care and social responsibility. We commit to minimising pollution and contributing towards a sustainable future by achieving a balance between environmental, technological, economic and social objectives.

UGL seeks the combined efforts of all employees, subcontractors and suppliers to ensure the effectiveness and success of our approach to environmental sustainability.

UGL is committed to:

- Complying with the requirements of the CIMIC Group Environment Policy
- Undertaking our operations and delivering products and services in accordance with the international standard for Environment Systems, ISO 14001
- Setting objectives and targets to reduce environmental risk and improve sustainability
- Ensuring our operations, products and services comply with applicable legal and other requirements
- Taking steps to prevent pollution, conserve natural resources, protect cultural heritage, minimise waste and drive energy efficiency
- Providing appropriate environmental training to assist in meeting our objectives and reducing any adverse impacts on the environment
- Making continual improvements in environmental performance and protecting the environment
- Communicating with our employees, clients, suppliers, contractors and community on our environmental performance
- Promoting sustainable practices within our supply chain and reduce our broader environmental impacts

Our management will also:

- Establish environmental systems and processes to minimise environmental impacts, comply with legal and other obligations and improve the environmental outcomes of our clients and the community
- Conduct monitoring evaluation to ensure environmental compliance and obligations are achieved
- Require suppliers and subcontractors to operate in an environmentally responsible manner and adhere to relevant environmental requirements
- Regularly review performance, identify and implement corrective and preventive actions that contribute to continually improving the environmental performance of our operations, products and services

Managing Director UGL [signature] Date 10/10/17

Title: UGL Environment Policy-PO-64-89
ID: DOCS-64-89 Version: 2.0
Management System – Uncontrolled Document when Printed

A MEMBER OF THE CIMIC GROUP CIMIC

BUREAU VERITAS
Certification

Certification

Awarded to

UGL PTY LTD

40 MILLER STREET, NORTH SYDNEY, NSW, 2060
AUSTRALIA

(REFER TO APPENDIX FOR LIST OF INCLUDED DIVISIONS AND SITES)

Bureau Veritas certify that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards indicated below

STANDARD

ISO 14001:2015

SCOPE OF SUPPLY

- **PROVISION OF ENGINEERING DESIGN, PROJECT MANAGEMENT OF CONSTRUCTION AND COMMISSIONING AND MANUFACTURING SERVICES.**
- **PROVISION OF OPERATIONS AND MAINTENANCE, ASSET MANAGEMENT, UPGRADES AND OVERHAULS AND FACILITIES MANAGEMENT SERVICES FOR CLIENT OWNED ASSETS.**
- **PROVISION OF EXPLOSION-PROOF EQUIPMENT OVERHAUL WORK.**

Original Approval Date: **5 November 2004**

Subject to the continued satisfactory operation of the organisation's Management System, this certificate is valid until: **3 April 2026**

To check the validity of this certificate please call tel. **1800 855 190**

Further clarification regarding the scope of this certificate and the applicability of the Management System requirements may be obtained by consulting the organisation.

Certificate Number: **AU005369-1**

Date: **31 March 2023**

Appendix C Legal Register

Instrument	Title	Obligation	Environmental Aspect/Activity	Applicable Project/Site (Y/N)
Commonwealth Legislation	*Environment Protection and Biodiversity Conversation Act 1999*	Ensure that the Secretary of the Department of Climate Change, Energy, the Environment and Water (DCCEW) is notified within 7 days if an action results in the death, injury, taking, trading, keeping or moving of a member of a listed threatened species, ecological community, migratory species, listed marine species or cetacean (whale, dolphin, porpoises, narwhale).	Construction	Y
	Native Title Act 1993	PQ Obligation.	Construction	Y
	Aboriginal and Torres Strait Islander Heritage Protection Act 1984	Preserve and protect all places, areas and objects that are of particular significance to Indigenous Australians. Any discovery of suspected Aboriginal remains shall be reported to the Minister, giving particulars of the remains and of their location.	Construction	Y
QLD Legislation	*Electricity Act 1994*	Under Section 31(b) of the Electricity Act 1994, a transmission entity is required to properly take into account the environmental effects of its activities under the transmission authority. Section 112A of the Electricity Act 1994 makes clearing of native vegetation on freehold land accepted development if the clearing is for operating works for a transmission entity on land designated for the operating works by a Minister under the Planning Act 2016.	Construction	Y
	Electricity Safety Act 2002	Seeks to prevent through regulation, the death, injury and destruction that can be caused by electricity.	Construction	Y
	Land Act 1994	PQ Obligation.	Construction	Y
	Transport Infrastructure Act 1994	Requirement to address standards applicable to road upgrades, accesses and road condition, working in/adjacent to a railway corridor.	Construction	Y
	Aboriginal Cultural Heritage Act 2003	All reasonable and practicable measures will be taken to ensure the activity does not harm Aboriginal and Torres Strait Islander cultural heritage. If any cultural heritage items are discovered during activities on the site, notification to the department and proper handling of items will occur. Take all reasonable steps to advise the chief executive of the existence, nature and location of human remains. If in possession of human remains, take all reasonable steps to ensure the remains are taken to the custody of the chief executive as soon as practicable.	Construction	Y

Instrument	Title	Obligation	Environmental Aspect/Activity	Applicable Project/Site (Y/N)
		Do not knowingly contravene a stop order. A stop order may be given if the Minister believes an activity will harm or have a significant adverse impact on Aboriginal or Torres Strait Islander cultural heritage. Develop a Cultural Heritage Management Plan if required by: • A lease, licence, permit, approval or other authority is required for the project, and an EIS or any other environmental assessment is required for the project; or • A development application is made relating to the project, and the chief executive is a concurrence agency for the application; or • Prescribed by any legislation. • PQ Obligation.		
	Queensland Heritage Act 1992, s89	Notify the DES of an archaeological artefact that is an important source of information about an aspect of Queensland history. PQ Obligation.	Construction	Y
	Biosecurity Act 2014	The Biosecurity Act 2014 is administered by the Department of Agriculture and Fisheries (DAF). The Act provides management measures to protect agricultural and tourism industries and the environment from pests, diseases and contaminants. A person: • dealing with a biosecurity matter or carrier, or • carrying out an activity that the person knows or reasonably ought to know that the biosecurity matter, carrier or activity poses or is likely to pose a biosecurity risk, has a general biosecurity obligation: • to take all reasonable and practical measures to prevent or minimise the biosecurity risk • to prevent or minimise adverse effects on a biosecurity - consideration of the person's dealing with the biosecurity matter, carrier or carrying out the activity • to minimise the likelihood of causing a biosecurity event, or to limit its consequences • not to do or omit to do something that the person knows or reasonably ought to know, may exacerbate the adverse or potential adverse effects, of the biosecurity matter, carrier or activity on a biosecurity consideration.	Construction	Y
	Environmental Protection Act 1994 *Environmental Policies*	Take all reasonable and practicable measures to prevent or minimise environmental harm which carrying out activities on site. If any serious or material environmental harm is caused (or threatened), notify in writing to	Construction	Y

Instrument	Title	Obligation	Environmental Aspect/Activity	Applicable Project/Site (Y/N)
	Environmental Regulation	DES (or the administering authority) about the event. Protect environmental values. Obtain environmental licences.		
	Nature Conservation Act 1992 *Nature Conservation (Wildlife) Regulation 2006*	It is an offense to take or use protected wildlife, which is outside a 'protected area', unless exemptions apply or an approval is obtained from the DES.	Construction	Y
	Fisheries Act 1994	This legislation ensure management of QLD's Fisheries are economically viable, socially acceptable and ecologically sustainable. The alignment crosses a number of waterways and depending on the final construction methodology will require either a development permit for waterway barrier works or compliance with Accepted Development requirements.	Construction	Y
	Forestry Act 1959	The draft alignment does not traverse any State Forests, nor purpose to sell or dispose of forestry products. Quarry material will be required for the construction of the Project. In most instances' material will be obtained from an existing licenced source, however in some locations extraction of material may be required due to locational factors. Where a new source of quarry material is required, the suitable permits and licences will be obtained.	Construction	Y
	Vegetation Management Act 1999	The purpose of the VM Act is to regulate the clearing of vegetation in a way that: (a) conserves remnant vegetation; (b) conserves vegetation in declared areas; (c) ensures that clearing does not cause land degradation; (d) prevents the loss of biodiversity; (e) maintains ecological processes; (f) manages the environmental effects of the clearing to achieve the matters mentioned in paragraphs (a) to (e); and (g) reduces greenhouse gas emissions (refer Section 3(1) of the VM Act). The project is intending to undertake vegetation clearing activities.	Construction	Y
	Water Act 2000	Do not take water from a waterway, water bore (or other defined sources) without a licence or permit issued under the Water Act 2000 (unless exempt as per relevant guidelines). Use a licensed driller to construct or alter water bore of more than six metres depth.	Construction	Y
	Planning Act 2016	Establishes an efficient, effective, transparent, integrated, coordinated, and accountable system of land use planning (planning), development assessment and related matters	Construction	Y

Instrument	Title	Obligation	Environmental Aspect/Activity	Applicable Project/Site (Y/N)
		that facilitates the achievement of ecological sustainability. Off-easement activities and specific works/activities may require secondary approvals pursuant to the Planning Act, if assessable. Ministerial Infrastructure Designations (MIDs), a process for certain types of infrastructure approval is an alternative to lodging a development application. MID applications are proposed for camps, substations and transmission line works.		
	Waste Reduction and Recycling Act 2011	Waste from the site activities will be managed in a way which provides the best environmental outcome and in accordance with the waste management hierarchy and local requirements.	Project works, civil and electrical	Y
	Water Supply (Safety and Reliability) Act 2008	Operation of accommodation hubs water treatment plants providing drinking water must meet drinking water supply standards/obligations (where not connected to mains or as a result of water proofing the facilities). Obtain registration as a water service provider if required, unless exempt.	Water treatment operators	TBC
QLD Planning Instruments	State Planning Policy 2017	The project will comply with the requirements stated in the policy and ensure their standards are aligned with this policy for Ministerial Infrastructure Designation application scopes	Construction	Y
	North Queensland Regional Plan	Currently being drafted by the DSDMIP. No assessment has been undertaken as of yet against the objectives of the plan.	Construction	Y
	The Gulf Regional Development Plan 2017	The project will use this plan as guidance in policy development and implementation of the project. The project does not materially conflict with any of the identified strategies.	Construction	Y
Local Planning Instruments	Town Plans Stock Routes Roads	Depends on approval strategy however all MID applications will address relevant planning scheme overlays and performance criteria	Construction	Y
	Roads Stock routes Building, plumbing and drainage	Local Government approval triggers as required, refer to the draft RAP - Appendix C	Construction	Y

Appendix D Regulatory Approvals Plan

A high level approval summary table has been identified in the project's 'Approvals and Compliance Matrix' provided by the Client. In response, the JV has prepared a draft Regulatory Approvals Plan (RegAP).

Appendix E Aspects and Impacts Register

HSEQ Risk Register for: CopperString 2032 Joint Venture

								Risk Rating (assuming controls listed are implemented)			SWMS Requirement		
Ref	**Category**	**Work Phase** Select from Drop-down list. If desired value is not available, update Work Breakdown Structure Tab.	**Grouped Work Activity** Select from Drop-down list. If desired value is not available, update Work Breakdown Structure Tab.	**Sub-activities** This should also include detail of how the grouped work activity is being completed	**Hazard / Aspects**	**Potential Consequences / Un-wanted Event / Impacts**	**Controls** Provide details of the specific controls needed to manage the risk. Do not list controls that are not relevant to the work being performed 'e.g. outriggers if using an excavator as a lifting device'	**Consequence**	**Likelihood**	**Risk Rating**	**High Risk Construction Activity?**	**Activity involves a JV Critical Risk?**	**SWMS Required?**
59	**Environment**	Site Mobilisation	**Emergency Response**	Emergency Response (Planned / Unplanned Activities)	Extreme weather conditions (heat, wind, rain lightning)	Inability to provide first response to injury.	Weather monitoring through external applications - WeatherZone Defibrillators for remote areas as required by risk assessment. Emergency management plan Site based paramedic. Local QAS resource as back up	5	Unlikely	C - High	No	No	No
60	**Environment**	Site Mobilisation	**Emergency Response**	Emergency Response (Planned / Unplanned Activities)	Fauna (snakes, cattle etc.)	Injury/illness/fatality	Dial 000 or 112 in an EMERGENCY Remote First Aid training of UGL Supervisors First Aid Kits available in all Vehicles + qualified First Aid personnel nominated per crew, Fauna will be handled in accordance with the Fauna Handling and Rescue Procedure as part of the Flora and Fauna Mgt Plan	4	Rare	D - Moderate	No	No	No
61	**Environment**	Site Mobilisation	**Emergency Response**	Emergency Response (Planned / Unplanned Activities)	Interaction with third parties (public, traditional owners, land owners etc.)	Failure to effectively communicate emergency situation resulting in exacerbation of injury/illness to workers.	Evacuation plans established and communicated Satellite devices in blackspot areas, as assessed Two way UHF radio system in vehicles	4	Rare	D - Moderate	No	No	No
62	**Environment**	Site Mobilisation	**Emergency Response**	Emergency Response (Planned / Unplanned Activities)	Responding to traumatic events (psychosocial hazard)	Vehicles unable to respond to emergency due to inability to travers through harsh terrain."	4wd vehicles only Emergency+ app to be used for raising. Emergency Response Plan Site based Paramedic Critical Incident Response Training	5	Unlikely	C - High	No	No	No
88	**Environment**	Early works	**Geotechnical Investigation**	Survey & Pegging	Dangerous/venomous fauna	Poisoning from dangerous wildlife resulting in illness/medical emergency	Trousers, long sleeve shirt, boots. (site PPE) Note: Snake gaiters worn when identified. Slashing of grass when applicable Snake bit kits	4	Rare	D - Moderate	No	No	No
90	**Environment**	Early works	**Geotechnical Investigation**	Survey & Pegging	Uneven ground	Trips and falls resulting in personal injury	Correct footwear. Where practical ensure paths are levelled.	2	Unlikely	E - Low	No	No	No
100	**Environment**	Early works	**Geotechnical Investigation**	Operation of Mobile Plant	Working without accurate survey data.	Drilling/operating within areas of cultural sensitivity land	Survey data to be readily available to all supervisors, including operating areas, no go zones and access tracks. Work pack to include all required permits	4	Unlikely	C - High	Yes	No	Yes
101	**Environment**	Early works	**Geotechnical Investigation**	Operation of Mobile Plant	Operating earth works equipment on undisturbed land	Drilling/operating within areas of cultural sensitivity land	Unauthorised access to plant operating zones must be prevented using signage and physical barriers where practicable, and/or physical distance to separate pedestrians (workers and public) from powered mobile plant. Planning of works to ensure all work is away from potential risk of encroaching safe approach distances to overhead powerlines.	3	Rare	E - Low	Yes	No	Yes
104	**Environment**	Early works	**Geotechnical Investigation**	Geophysics Testing	Unauthorised access to cultural heritage	Entering cultural heritage area or damaging cultural heritage significant area whilst recovering. Access to areas outside LAP cultural heritage breach	Adherence to LAP requirements Adhering to corridor restriction Inclusion of TO Monitoring	4	Rare	D - Moderate	No	No	No
107	**Environment**	Early works	**Geotechnical Investigation**	Recovery of broken down or bogged plant and equipment	Unauthorised access to cultural heritage	Entering cultural heritage area or damaging cultural heritage significant area whilst recovering.	Unexpected finds procedure for any new finds Adhere to requirements of LAP Inspect and recertify after use, remove any damaged equipment from service. Securing points of recovery equipment to be rated. Heavy vehicles recovery will only be performed by specialised contractors.	4	Unlikely	C - High	No	No	No
111	**Environment**	Early works	**Geotechnical Investigation**	Heavy Vehicle Operations	Travelling in harsh terrain	Travelling in harsh conditions/terrain Uncontrolled fauna Contact with fauna	Survey data to be readily available to all supervisors, including operating areas, no go zones and access tracks. Work pack to include all required permits	3	Possible	C - High	Yes	No	Yes
116	**Environment**	Early works	**Geotechnical Investigation**	Borehole Drilling	Noise Pollution Excessive Noise Exposure	Long Term Noise exposure Noise Trauma Long Term Hearing Loss Noise complaints	Information and Training awareness Correct PPE including hearing protection to be used where necessary. Ensure all guards and buffers are installed and working. Noise complaint procedure Notification to land owners etc. LAP procedure **Refer to Health & Hygiene risk number 21 "Exposure to Noise".**	3	Unlikely	D - Moderate	No	No	Yes
117	**Environment**	Early works	**Geotechnical Investigation**	Borehole Drilling	Exposure - Respirable crystalline silica (dust)	Dust inhalation Chronic illness from exposure to hazardous substances i.e. silica	Information and Training awareness Warning Signage and protection Insulated cabin protection LAP procedure Minimise land clearing and roll only where practicable Water for dust suppression Land Rehabilitation Provision of adequate PPE All respiratory PPE to be fit tested **Refer to Health & Hygiene risk number 21 "Exposure to Dust".**	4	Rare	D - Moderate	Yes	No	Yes
118	**Environment**	Early works	**Dilapidation survey**	Road Dilapidation	Unstable terrain	Plant and equipment damage	Spotter to observe oncoming traffic and positive communication maintained with work crew.	4	Rare	D - Moderate	Yes	No	Yes
119	**Environment**	Early works	**Dilapidation survey**	Road Dilapidation	Wild Animals	Vehicle impacting livestock, obstacles on the roads resulting in vehicle incident	Spotter to observe oncoming traffic and positive communication maintained with work crew. Workers to park vehicle in a safe location, designated parking zones, easily accessible side streets where parking is permitted, land owner permitted locations).	3	Possible	C - High	No	No	No
126	**Environment**	Early works	**General Works**	Clearing Vegetation on rural land	Unauthorised Vegetation/ground disturbance Clearing Breaching permitting requirements	Clearing outside of approved clearing zone DES fines Reputation impact Disturbing cultural heritage zone	Qualified Fauna Spotter in place to monitor fauna Drawing of protected area Sensitive areas to be pegged and flagged as required Supervisor to walk through and identify path with minimal disturbance to test location Understanding LAP / Secondary approvals (Clearance limits) Follow Unexpected Finds Procedure with relevant CHMP for any find/s discovered	4	Possible	C - High	Yes	No	Yes
130	**Environment**	Early works	**General Works**	Clearing Vegetation on rural land	Flora & Fauna	Injury/Death of Fauna Disturbance to breeding places Disturbing of protected plants DES fines	Fauna Spotter / Fence off Livestock from Construction zone Pre clearance survey's to identify high risk fauna areas and protected flora areas	4	Rare	D - Moderate	No	No	No

Activity Assessment and Controls								Risk Rating (assuming controls listed are implemented)			SWMS Requirement		
Ref	**Category**	**Work Phase** Select from Drop-down list. If desired value is not available, update Work Breakdown Structure Tab.	**Grouped Work Activity** Select from Drop-down list. If desired value is not available, update Work Breakdown Structure Tab.	**Sub-activities** This should also include detail of how the grouped work activity is being completed	**Hazard / Aspects**	**Potential Consequences / Un-wanted Event / Impacts**	**Controls** Provide details of the specific controls needed to manage the risk. Do not list controls that are not relevant to the work being performed 'e.g. outriggers if using an excavator as a lifting device'	**Consequence**	**Likelihood**	**Risk Rating**	**High Risk Construction Activity?**	**Activity involves a JV Critical Risk?**	**SWMS Required?**
131	**Environment**	Early works	**General Works**	Clearing Vegetation on rural land	Interaction with dangerous wildlife	Insect & Snake Bites	PPE / Snake Bite Kit / First AID kit / Posters notifying of nearest Medical support First Aiders (min 1/10/crew)	3	Rare	E - Low	No	No	No
132	**Environment**	Early works	**General Works**	Clearing Vegetation on rural land	Inclement Weather	Sediment Run Off Erosion Tracking sediment onto public roads	Minimal ground disturbance - keep ground cover/topsoil in place repurpose cleared vegetation Track Management (open/closed roads) Ensure wheels are cleaned prior to entering public road from site in wet/muddy conditions	3	Rare	E - Low	No	No	No
134	**Environment**	Early works	**General Works**	Clearing Vegetation on rural land	Clearing ground Soft ground conditions	Personnel injured whilst retrieving bogged plant equipment	Experienced competent operators (Verification of Competency) Activiti executed under SWMS and controls followed Rated extraction equipment to be used Equipment/plant will be maintained and inspected. No operations are to occur in the direct vicinity of where unloading/loading activities are occurring. Deliveries to occur only in area designated within Traffic Movement Plan.	4	Possible	C - High	Yes	No	Yes
156	**Environment**	Early works	**General Works**	Light vehicle Operations (Driving on sealed and unsealed roads)	Travelling within culturally sensitive locations	Accessing land without required approvals Disturbance of cultural heritage areas Driving on access track that is not approved as part of LAP	Follow all requirements of Land access permits GIS data to identify approved access routes Communication/consultation with traditional owners	5	Unlikely	C - High	Yes	No	Yes
158	**Environment**	Early works	**General Works**	Light vehicle Operations (Driving on sealed and unsealed roads)	Operating four wheel drive vehicles on gravel or dirt (unsealed) roads	Equipment damage due to vehicle collision/rollover	Drivers to rest every two hours. A journey management plan approved by an immediate supervisor is required for light vehicle trips exceeding 4 hours continuous driving on sealed roads, with consideration of fatigue. Tracks and ground conditions maintained	5	Unlikely	C - High	Yes	No	Yes
161	**Environment**	Early works	**General Works**	Light vehicle Operations (Driving on sealed and unsealed roads)	Fauna on the road or verge	Collision with animals	Weather Reports (BOM) to be monitored throughout the day for changes. Decisions are made on safe conditions for travel with information provided on the day.	5	Rare	D - Moderate	Yes	No	Yes
165	**Environment**	Early works	**General Works**	Handling & Storage of Chemicals	Chemicals containers stored in direct sunlight causing degradation of material and potential uncontrolled release.	Environmental harm Spill resulting in Damage to ecosystem / Damage to waterways / Damage to flora and fauna	Secondary containment on all cabinets Spill response training delivered to all project personnel (Rapid Global) Bunds to be installed and any area where chemicals could spill to grade"	4	Rare	D - Moderate	No	No	No
169	**Environment**	Early works	**General Works**	Working in remote location	Waste Management	Pollution to immediate environment	All waste to be disposed of offsite at dedicated facility Portable toilets to be pumped out off site (when returned)	4	Rare	D - Moderate	No	No	No
194	**Environment**	Camp Construction	**Camp - Waste Management**	Waste Management	Incorrect Disposal of waste	Damage to natural area Prosecution or Fines Pollution to the environment Contamination	Construction Environmental Plan Waste Management Plan Recycling Program Concrete Wash out Bays Signage and Awareness General Housekeeping Practices Supply of Adequate bins Waste segregation (bins to be labelled) Regulated waste to be disposed of correctly and tracking certificates produced when required	3	Rare	E - Low	No	No	No
210	**Environment**	Camp Construction	**Camp - Excavation & Trenching**	Working near Culturally Sensitive Areas	Impact to a culturally sensitive site	Damage to cultural heritage sites / artifacts Discovery of unknown cultural heritage area / site / artifact and not stopping work. Prosecution or Fines Damage to Reputation	Land Access Permits Delineate areas of interest with barricading (as per LAP) Cultural Heritage Awareness inductions Cultural Monitor present for Guidance Communication and Awareness during Prestart Environmental Work Method Statements Sensitive Area Plans	2	Unlikely	E - Low	No	No	No
211	**Environment**	Camp Construction	**Camp - Excavation & Trenching**	Dewatering of excavations/piles	Inappropriate disposal of accumulated water	Land/ surface water/ groundwater pollution Breach of legislation	Dewatering permit is to be obtained Water is to be tested prior to release	4	Rare	D - Moderate	No	No	No
216	**Environment**	Camp Construction	**Camp - Excavation & Trenching**	Excavation & Trenching	Fauna fall into excavation	Fauna trapped or crushed by operating equipment	**Refer to aspects & Impacts line 10** Ramps dug/escape route into trenching at identified distances for egress. Excavation/trench inspected for fauna prior to further works	4	Unlikely	C - High	No	No	Yes
228	**Environment**	Camp Construction	**Camp - Clearing works**	Clearing and grade of access tracks and pads.	Flora & Fauna	Injury/Death of Fauna Disturbance to breeding places Disturbing of protected plants DES fines	Fauna Spotter / Fence off Livestock from Construction zone Pre clearance survey's to identify high risk fauna areas and protected flora areas Clearing to be undertaken as per SMP and SSMP requirements Fauna Spotter Catchers to be present for all clearing activities Daily pre-clearing checklist To be undertaken in accordance with the Fauna Handling and Rescue Procedure Vehicles and plant are to remain on dedicated haul roads and access roads to avoid potential damage to flora and fauna	2	Possible	D - Moderate	No	No	No
232	**Environment**	Camp Construction	**Camp - Clearing works**	Clearing and grade of access tracks and pads.	Stockpile Management	Height of stockpile/machinery roll over	All stockpiles will be managed as per stockpile management plan. Limit height/batter - below 2 meters Stockpiles left on site for long periods shall be assessed and a storage plan be developed to endure environmental impact is minimised. Reference Rehab Plan	3	Unlikely	D - Moderate	No	No	No
233	**Environment**	Camp Construction	**Camp - Clearing works**	Clearing and grade of access tracks and pads.	Stockpile Management	Sediment Run Off	All Controls in place as per CEMP and ESCP No stockpiles within 50 meters of watercourse Stockpiles not to be left on site for long periods on site Reference Rehab Plan	3	Unlikely	D - Moderate	No	No	No
234	**Environment**	Camp Construction	**Camp - Clearing works**	Clearing and grade of access tracks and pads.	Access through watercourses	Damage to riparian zone Damage to aquatic habitat Degradation of water quality failure to adhere to permit/approval conditions	Watercourses crossings to be constructed as per accepted development for WWBW Minimise disturbance within watercourses Where required take base surface water quality readings and ensure water values remain within parameters All crews to have access to spill kits	3	Unlikely	D - Moderate	No	No	No
239	**Environment**	Camp Construction	**Camp - Construction of access roads/ paths**	Clearing and grade of access tracks and pads.	Inclement Weather	Sediment Run Off Erosion Tracking sediment onto public roads	Ensure all controls are in place as per CEMP and ESCP - where possible repurpose cleared vegetation Track Management (open/closed roads) Keep land disturbance to a minimum and rehabilitate/reinstate as soon as practical Ensure wheels are cleaned prior to entering public road from site in wet/muddy conditions Complete washdowns on vehicles and machinery and complete a biosecurity declaration Suitably qualified persons to inspect plant and machines prior to entry	2	Possible	D - Moderate	No	No	No
249	**Environment**	Camp Construction	**Camp - Completions**	Use of Hot bitumen spray seal	Run off from hot bitumen	Environmental damage to waterways and habitat	Review weather to ensure conditions are appropriate for task. Ensure work is completed away from waterways/known habitat/excluded areas.	2	Possible	D - Moderate	No	No	Yes

Activity Assessment and Controls								Risk Rating (assuming controls listed are implemented)			SWMS Requirement		
Ref	**Category**	**Work Phase** Select from Drop-down list. If desired value is not available, update Work Breakdown Structure Tab.	**Grouped Work Activity** Select from Drop-down list. If desired value is not available, update Work Breakdown Structure Tab.	**Sub-activities** This should also include detail of how the grouped work activity is being completed	**Hazard / Aspects**	**Potential Consequences / Un-wanted Event / Impacts**	**Controls** Provide details of the specific controls needed to manage the risk. Do not list controls that are not relevant to the work being performed 'e.g. outriggers if using an excavator as a lifting device'	**Consequence**	**Likelihood**	**Risk Rating**	**High Risk Construction Activity?**	**Activity involves a JV Critical Risk?**	**SWMS Required?**
334	**Environment**	Repeatable Activities	**General Works**	Light vehicle Operations	Dust	generation of dust causing nuisance	Use of water to suppress dust	1	Likely	E - Low	No	No	No
335	**Environment**	Repeatable Activities	**General Works**	(Driving on sealed and unsealed roads)	Accessing work sites - Biosecurity	Spread of weeds	Driving speeds to <40km/hr	3	Unlikely	D - Moderate	No	No	No
336	**Environment**	Repeatable Activities	**General Works**	Driving to and from site	Paleontological finds	unexpectedly unearthing paleontological finds/natural heritage	Complaints relating to dust will be handled in accordance with the complaint protocol in the AQMP	3	Unlikely	D - Moderate	No	No	No
337	**Environment**	Repeatable Activities	**General Works**	Unexpected finds	Movement of dirt/soil	Accidental spread of fire ants/yellow crazy/electric ants	Biosecurity declaration certificates	3	Unlikely	D - Moderate	No	No	No
240	**Environment**	Repeatable Activities	**General Works**	Light vehicle Operations (Driving on sealed and unsealed roads)	Dust	Generation of dust causing nuisance	Use of water to suppress dust Driving speeds to <40km/hr Complaints relating to dust will be handled in accordance with the complaint protocol in the AQMP	1	Likely	E - Low	No	No	No
335	**Environment**	Repeatable Activities	**General Works**	(Driving on sealed and unsealed roads)	Accessing work sites - Biosecurity	Spread of weeds	Biosecurity declaration certificates Vehicles certified as weed and seed free driving restricted to designated access tracks weed surveys to determine any potential spread	3	Unlikely	D - Moderate	No	No	No
336	**Environment**	Repeatable Activities	**General Works**	Driving to and from site	Paleontological finds	unexpectedly unearthing paleontological finds/natural heritage	Follow unexpected paleontological finds procedure potential collaboration with JCU + QLD Museum	3	Unlikely	D - Moderate	No	No	No
337	**Environment**	Repeatable Activities	**General Works**	Unexpected finds	Movement of dirt/soil	Accidental spread of fire ants/yellow crazy/electric ants	Biosecurity declaration certificates toolbox talks	3	Unlikely	D - Moderate	No	No	No
338	**Environment**	Repeatable Activities	**General Works**	Movement of materials from coastal regions	Arrival of goods in Australia	Cargo imported is contaminated	Cargo to be inspected for high risk pests (if coming from a CAL country(Country Action List)) before being unloaded and transported to site Vehicles certified as weed and seed free	3	Possible	C - High	No	No	No
239	**Environment**	Repeatable Activities	**General Works**	Logistics (movement of equipment/material)	Contaminated Land	Accidental movement of contaminated soil	Contamination sites to be clearly demarcated and communicated driving restricted to designated access tracks	3	Unlikely	D - Moderate	No	No	No
334	**Environment**	Repeatable Activities	**General Works**	Light vehicle Operations	Dust	generation of dust causing nuisance	Use of water to suppress dust	1	Likely	E - Low	No	No	No
337	**Environment**	Repeatable Activities	**General Works**	Movement of materials from coastal regions	Movement of dirt/soil	Accidental spread of fire ants/yellow crazy/electric ants	Biosecurity declaration certificates. Washdown	3	Unlikely	D - Moderate	No	No	No
338	**Environment**	Repeatable Activities	**General Works**	Logistics (movement of equipment/material)	Arrival of goods in Australia	Cargo imported is contaminated	Cargo to be inspected for high risk pests (if coming from a CAL country(Country Action List)) before being unloaded and transported to site	4	Possible	C - High	No	No	No
339	**Environment**	Repeatable Activities	**General Works**	General works	Contaminated Land	Accidental movement of contaminated soil	Contamination sites to be clearly demarcated and communicated. Sites to be captured on the SEP.	3	Unlikely	D - Moderate	No	No	No

Appendix F CEMP Sign Off

We, the undersigned, confirm that the responsibilities nominated below have been explained and its contents are clearly understood.						
Position	Name	Signature	Date	Name	Signature	Date
Project Director						
Project Manager						
Construction Managers						
Supervisors						
HSEQ Director						
Environmental Manager						

Powerlink QUEENSLAND | COPPERSTRING 2032

UGL | CPB CONTRACTORS

COPPERSTRING 2032 JV

CONSTRUCTION WATER MANAGEMENT PLAN

COPPERSTRING 2032

EDMS No : CSPW-CON-PLN-900-000005
Revision : A02
Date : 26/06/2024

Status: IFR

Approvals and Reviews

Construction Water Management Plan	
Project	CopperString 2032
Client	Powerlink Queensland
Document Number	CSPW-CON-PLN-900-000005

Revision History

Rev No.	Description of Revision	By	Checked	Approved	Date
A01	Developed for PDLA Construction Scope of works	Luke Baker	David Mclean	Micheal Dawson	03/05/2024
A02	Updated in response to comments	Jacinta Fuller	Luke Baker	Michael Dawson	26/06/2024

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Appendices

Appendix A List of Water Investigation Reports

1. Introduction

The purpose of the CopperString 2032 project is to connect the North West Minerals Province (NWMP) of Queensland to the National Electricity Grid. This will not only allow existing loads in the Mt Isa and Cloncurry areas to be fed from the National Electricity Market (NEM), but also provide access to new mining loads and opportunity for connection of renewable generation.

1.1 Project Scope

The CopperString 2032 Project is an extra high voltage transmission system intended to connect the North West Power System (NWPS) near Cloncurry and Mount Isa to the Powerlink network and NEM at Mulgrave. Figure 1 provides an overview of the Project.



Figure 1: CopperString 2032 proposed transmission lines and substations

The CopperString 2032 Project will connect the NWMP to the NEM to reduce the cost of power supply and facilitate the large-scale development of the Hughenden wind resource and solar resources within the North Queensland Clean Energy Hub (NQCEH).

The scope of work, traversing east to west, consists of the following sections:

- Mulgrave 500/275kV Substation as the CopperString 500kV connection point to the Queensland SuperGrid and 275kV line augmentation as the CopperString 275kV connection point to the NEM
- Pentland 500kV Substation to support the North Queensland Clean Energy Hub (NQCEH) expansion and as the core for future load connections in the area
- Flinders 500/300kV Substation (Hughenden) as the core for the NQCEH
- Dajarra Road 330/220kV Substation (Cloncurry) as the core for distributions to larger load centres
- The primary CopperString transmission backbone
- Termination via the Mount Isa augmentation 220/132kV.

The scope consists of a transmission line between the above locations carrying extra high voltage power transmission at 500kV, 330kV and 220kV respectively. Substations at the abovementioned interconnecting junctions will distribute power to the NWMP and NQCEH.

The project scope, from a waste perspective includes:

- Waste generation from procurement, design and construction methodology
- Waste storage at transit and temporary hubs
- Waste handling in accordance with end use arrangements and legal requirements
- Waste measuring and reporting.

1.2 Abbreviations, acronyms and definitions

The following table lists the acronyms used in this plan, including their definitions.

Table 1: Abbreviations, acronyms & definitions

Term	Definition
CEMP	Construction Environmental Management Plan
PQ	Powerlink Queensland
UGL CPB JV (the JV)	UGL, CPB Contractors Pty Limited Joint Venture
the Project	CopperString 2032
JV Project area	Extends from Townsville to Mount Isa across Local Government areas
Contaminated Land	Contaminated Land means land or matter in or on the land that is affected by a hazardous substance so that it is, or causes other land, water and air to be a hazard to human health or to the environment. Matter is interpreted to include: • Surface waters • Groundwater • Soil gases. Contaminated land may include contaminated soil or waters impacted by the project as a result of spills, for example.
Council	Local Government Authorities in the Project area
CWMP	Construction Water Management Plan (this plan)
EIS	Environmental Impact Statement
EMF	Environmental Management Framework
EP Act	*Environmental Protection Act 1994*
Generator	A generator is often a commercial or industrial organisation which produces or stores trackable regulated waste and arranges for this waste to be sent for storage, recycling, treatment or disposal at another location via an authorised transporter
MID	Ministerial Infrastructure Designation
NEM	National Electricity Market
NQCEH	North Queensland Clean Energy Hub
NWMP	North West Minerals Province
NWPS	North West Power System
Regulated Waste	Defined in s42 of the EP Regulation and is commercial or industrial waste, whether or not it has been immobilised or treated; and is of a type, or contains a constituent of a type, mentioned in Schedule 9 part 1 of the regulation and includes for an element—any chemical compound containing the element; and anything that contains residues of the waste
Trackable waste	A regulated waste of a type mentioned in Schedule 11 of the EP Regulation to which the waste tracking provisions of the regulation apply
WRRA	*Waste Reduction and Recycling Act 2011*

1.3 Plan purpose

This CWP has been prepared to identify construction water sources for the full project scope and to document the approach taken to ensure relevant requirements of approvals have been met, shortlisted sources and proposed operating standards.

This CWP will be read in conjunction with the CEMP – Water Quality Management Plan (technical) Sub Plan for the detail as to the ongoing management of the water sources during use, including:

- Water flow rates
- Water consumption (with fixed meters)
- Water Quality and Standing Water Level Monitoring
- Action Response Levels (ARLs) to ensure water sources remain viable and non-impacting (with respect to secondary users and environmental values, including consideration of end use values eg. Soil quality from dust suppression activities) and
- Water reporting

2. Interface with Environmental Management Framework

This Construction Water Management Plan (CWMP) is an activity specific sub-plan of the project's Construction Environmental Management Plan (CEMP) identified in the below Environmental Management Framework (EMF).

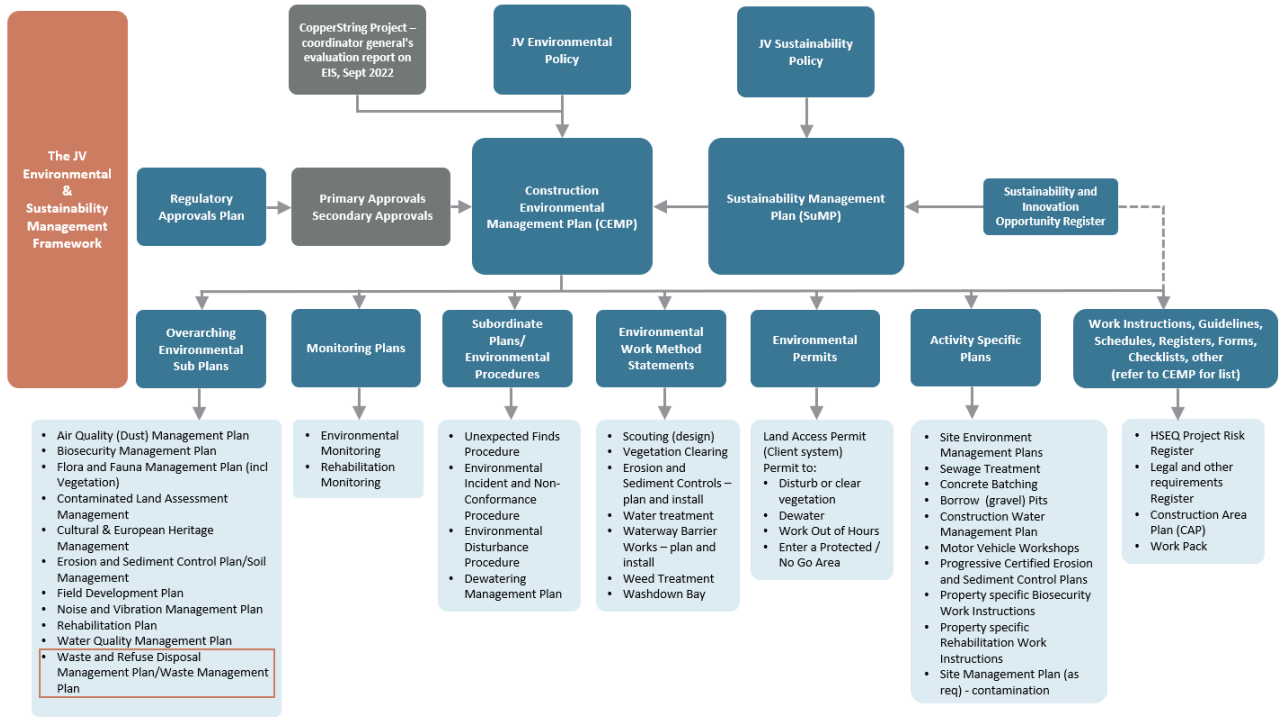

Figure 2: Environmental Management Framework – CWMP Interface

2.1 Plan scope

This CWMP addresses water requirements during construction and considers previous information provided in the CopperString Environmental Impact Statement (EIS) 'Volume 2 – Chapter 09 – Water Resources and Water Quality' and current scope and plan requirements.

Table 2: Water requirements

Source	Requirement
Construction Environmental Management Plan Section 18.2	• Water sources are fit for use (objective) • Weekly inspections of water sources and water storages (monitoring requirement). • Baseline testing and ongoing monthly testing of groundwater sources (monitoring requirement). [Also referenced in Section 8.2.4 summarizing project monitoring requirements] • Water use tracking, trending and triggers for early intervention for minimising consumption (monitoring requirement) • Task 18.2.2 "Prepare an Activity Specific – Water Source Management Plan. This plan must identify: ○ Water sources (and access) ○ Water approval requirements ○ Water monitoring requirements (levels and quality) ○ Triggers for corrective action (i.e. when water quality or standing water levels are statistically different from baseline sampling as a result of construction activities) Prior to selection of a groundwater bore, a pump test and drawdown investigation to ensure adequate yields will be undertaken" • Task 18.2.7 "Surface and ground waters will not be extracted (for construction use, or pumping / dewatering) without prior approvals / permits being in place, or as in line with legislated exemptions. Specifically in accordance with "OSW/2020/5467 Exemption requirements for constructing authorities for the take of water without a water entitlement" (Version 4.01, dated 05/02/2021). Water shall only be taken from points authorised by the Client in accordance with exemption notification requirements".
CopperString EIS CoG Report Appendix 2 Part A Recommendation #7	Any MID request(s) is to include a report on consultation with DRDMW and relevant local government councils regarding the use of existing licensed and authorised water sources during construction. This report should detail outcomes of this consultation and detailed agreed water supply solutions for construction of the project.
CopperString EIS CoG Report Appendix 2 Part B Condition 23 (recommended conditions for MID)	(a) Prior to commencement of works, the proponent is to develop a Construction Water Plan in consultation with the Department of Regional Development, Manufacturing and Water (DRDMW). The plan is to include: i. all sources of taking water, identifying locations where water will be acquired from ii. amount of water to be taken (outlining maximum limits) iii. locations of potential water interference, and any new or modified works that will capture overland flow and associated approvals iv. water resource objectives and mitigation controls. (b) During construction of the project, mitigation works and actions are to undertaken as identified in the Construction Water Plan.
CopperString EIS CoG Report Appendix 4 Commitment 79	A construction Water Plan will be developed during the detailed design phase with consultation of Department of Regional Development, Manufacturing and Water (DRDMW). This plan will include all sources of taking water, identifying locations where water will be acquired from, amount of water (outlining maximum limits), locations of potential water

Source	Requirement
	interference, and any new or modified works that will capture overland flow for construction purpose sand associated approvals. Water resource objectives and mitigation controls during the project will be outlined in the Water Plan as well as being in accordance with the Framework MP.
CopperString EIS Chapter 9 Section 9.4.4 – Mitigation and Management Measures	Prior to using an existing bore, undertake investigations to confirm adequate yield available for existing and proposed construction use. If required under licence or authorisation, monitoring will be undertaken to confirm draw down will not impact on existing entitlements or environmental values and water quality objectives
CopperString EIS CoG Report Appendix 4 Commitment 86 CopperString EIS Chapter 9, Section 9.5	Utilise existing licenced and authorised water sources during construction in consultation with Council, DNRME and landholders

2.2 Objectives

UGL CPB JV's (the JV) water management objectives include:

- Minimising the total amount of potable water used for construction (with specific focus in water stressed areas)
- Investigating water sources options to confirm no secondary user impacts or loss of environmental values
- Compliance with all legal obligations pertaining to water use, treatment and reuse
- Providing legacy solutions for regional water supply.

2.2.1 Legal obligations

Pursuant to OSW/2020/5467 Exemption requirements for constructing authorities for the take of water without a water entitlement (Version 4.01 dated 05/02/2021), Powerlink is a "constructing authority" and is exempt from water entitlement licencing subject to compliance with conditions therein.

Water take requirements for the construction camps are not presently covered under this exemption as such water for these facilities is being sourced through standard commercial arrangements with the applicable Local Government Authority (LGA).

2.3 Stakeholder engagement

This CWMP has been prepared in consultation with key Stakeholders as follows.

- Department of Regional Development, Manufacturing and Water (DRDMW)
- Landholders expressing interest in shared access to existing water infrastructure
- Landholders with title where new groundwater bores are proposed
- Local Government Authorities with respect to network supply and infrastructure.

2.4 Water demand

The construction of the project has an estimated water demand of up to 1649ML. Water quality and quantity will vary dependent on the activity or location specific requirement however can generally be separated into two different categories:

- Potable water (used within construction hubs)
- Non-potable water (all other project uses).

The below table outlines the estimated water volumes the project will require for each major water use and the water quality required. It should be noted that the project intends on using water treatment plants where required to ensure quality of water is fit for purpose, based on source water baseline sampling.

Table 3: Water Demand

Activity	Volume	Quality
• Accommodation ○ Food preparation ○ Direct consumption ○ Used in ice machines ○ Shower facilities ○ Satellite hygiene facilities Note, where required and possible it is proposed to use onsite treated wastewater to Class A+ for use in: ○ Washdown bays ○ Toilets and laundry (dual reticulation) ○ Motor vehicle workshops cleaning ○ Washing of insulators/construction materials ○ Landscaping	*209ML	Australian Drinking Water Guidelines Water quality guidelines for recycled water schemes (Department of Energy and Water Supply. 2008)
• Construction purposes ○ Dust suppression (subject to additional solutions used to prevent dust emissions) ○ Earthworks of access tracks and tower pads ○ Maintenance programs ○ Piling foundations ○ Rehabilitation watering programs	**1386ML	Construction Standards
• Biosecurity and cleaning purposes (on easement)	***20ML	Construction Standards
• Washing of insulators and construction materials (if no Class A+ water available)	0.5ML	Construction Standards
• Concrete batching	****33ML	AS (1379-2007)
• Firefighting tanks	0.2ML	Construction Standards

**Assumes 300L per person per day. (noting does not assume Class A+ for toilets and laundry as this is subject to regulatory approval)*

***Assumes 1ML per day. 1386 construction days*

****Assumes 23,000L per day (across 16 washdown sites). 910 construction days*

*****150,000t of concrete is required at 220L/m3.*

3. Water Sourcing Hierarchy

3.1 EIS Hierarchy

The water source hierarchy identified in the EIS (Chapter 9, Section 9.3.6) at the construction hubs was:

- Town water from existing Council water reticulation networks through construction of water supply pipelines where possible
- Access existing Council water reticulation networks through water tuck at the nearest access point
- Utilise groundwater through existing licence and authorised groundwater reserves in consultation with Local Council, DNRME and landholders.

The water source hierarchy identified in the EIS for the transmission line/substations was not explicit however existing bores and surface waters (i.e. watercourses) were identified as existing values. The predominant water supply in this region is groundwater.

3.2 Tendering option-engineering

A review of water sources, via desktop was undertaken in 2023, identified preferred water sources grouped by tower pads based on no hierarchy but locational availability and included either option for:

- Existing groundwater bores
- New groundwater bores
- Existing landholder dams
- Surface water take from watercourses.

3.3 Existing regional water supply

Existing regional water supply has been identified as follows for each of the regional areas the project intersects.

Where stakeholder consultation has been undertaken, this has been noted per location.

Table 4 Existing regional water supply

Location	Existing Drinking Water Source	Stakeholder consultation (preliminary)
Woodstock	Groundwater	No consultation to date
Charters Towers	Charters Towers Weir located on Burdekin River	Council discussions indicate acceptable connections are available.
Pentland	Glen Houghton bore field (2 bores pumped to town reservoir and disinfected with chlorine)	Council discussions indicate acceptable connections are available.
Hughenden	Groundwater (GAB)	Council discussions indicate acceptable connections are available.
Richmond	Groundwater (GAB)	Council discussions indicate acceptable connections are available.
Julia Creek	Groundwater (GAB)	Council discussions indicate acceptable connections are available.
Cloncurry	Cloncurry River Wells Cloncurry Weir Chinaman Creek Dam Julius Dam Water Supply Scheme	Council advised no known connections. Council advised no connections to a site bore.
Mt Isa	Lake Moondarra (via 750mm 13km pipeline + pumping station at Clear Water Lagoon) operated by Mt Isa Water Board Julius Dam Water Supply Scheme (via 900mm 70km pipeline) operated by SunWater	No consultation to date.
Private property between Woodstock and Mt Isa	Groundwater (bore owned and operated) and associated turkey nest storages Overland flow dams Watercourse pump and pipe configuration	No targeted consultation/agreements to date.

3.4 Adopted hierarchy

The adopted water source hierarchy has considered the hierarchy adopted in the CopperString EIS (refer to Section 2.6.1), option-engineering undertaken during JV tendering (refer to Section 2.6.2) and existing regional water supply (refer to Section 2.6.3).

The premise for the adopted water hierarchy is based on:

- Water security in a remote setting with limited water infrastructure, and predicted El Nino weather forecasting by installing independent/dedicated long term viable water bores at high demand locations
- Minimising interfaces with existing water users by installing new bores (co-located with infrastructure footprints) to reduce the potential for negative direct and indirect impacts including but not limited to:
  - Water transport traffic on roads
  - Clearing additional protected habitat for pipelines and water take/storage infrastructure, and
  - Reducing existing or future allocations.
- Treating wastewater to a Class A+ standard for reuse at construction hubs (eg. toilet flushing, laundry, washdown bay, workshop cleaning, dust suppression, and concrete batching)
- Construction scope, methodology, timing and staging, and
- Delivering sustainable outcomes from water development to support future regional growth.

The adopted hierarchy for water supply is tabulated below. This is multi-faceted as it considers the construction stages.

Note, early works by the project has relied on Council fill points and washdown bay access as water sources.

Table 5 Adopted Water Hierarchy

Location/ Aspect	Adopted Water Hierarchy
Camps / Hubs	Existing LGA Supply points – upgrades to network as required (including consideration of new bores if required)
Substations	Existing LGA Supply points – upgrades to network as required (including consideration of new bores if required) Trucking of water from source to works likely
Transmission Line	Existing groundwater bores and new groundwater bores. Some trucking of water from LGA sources may be required during early establishment phase

4. Water Source Investigation

4.1 Investigation method

A water source investigation has been undertaken with a focus on groundwater supply as per the adopted water hierarchy. Where groundwater supply has a low probability, alternative sources have been investigated. Refer to the water supply investigation method implemented.

Table 6 Water Supply Investigation Method

Step	Description	Timing
NA	Council consultation regarding town water supply and connections at proposed construction hubs. Construction hub design includes a dedicated groundwater bore and water treatment plant for water supply.	Complete

Step	Description	Timing
	Construction hub concept design includes a wastewater treatment plant to treat wastewater to a Class A+ standard to maximise reuse for primary contact and construction purposes.	
Step 1	Identify construction considerations (criteria) for water supply investigations.	Complete
Step 2	Investigate groundwater options to develop a secure permanent water supply at construction hubs. Draft the Construction Water Plan.	Complete
Step 3	(concurrent with step 2), Investigate: Groundwater areas along the transmission line to short list preferred locations Surface water options where groundwater feasibility is low Early stakeholder consultation with the DRDMW.	Complete
Step 4	Develop and implement a field drilling program to verify uncertainties in the technical assessment (obtaining permits as required).	Q2/Q3 2024
Step 5	Complete the groundwater investigation impact assessment and refine preferred locations. Engage affected landholders for consent and access. Finalise the Water Quality Management/Monitoring Plan. Complete the Construction Water Management Plan and submit as part of the Project CEMP. Obtain regulatory approvals as required.	Q3/Q4 2024
Step 6	Install production and monitoring bores concurrent with construction sequencing.	Q3/Q4 2024

4.1.1 Technical considerations

[To be populated following completion of Stage 4 above]

4.1.2 Constructability considerations

The following construction preferences have been considered in the water supply investigation.

- Basin/catchments with current moratorium to be preferentially avoided
- New bores are located on easement
- Existing bores are preferred where landholders have expressed interest in sharing water resources and infrastructure
- Bores are to be located preferentially not more than 30km distant
- Bores are preferentially located:
  - Within 5km of a substation
  - Within the study area of the EIS
  - If new bores, >2km from an existing bore unless a separate aquifer is the target
  - Where off easement, via existing access tracks
- Non-operational bores are discarded for operational use
- Bores have a flow rate of 12L/s to maximise tanker returns
- Bores meet water demand (cumulative volume) estimates
- Bores selected meet water quality criteria to avoid excess treatment requirements.

4.2 Groundwater investigation findings

Refer to Appendix A for reference list of Water Investigation Reports.

5. Preferred Construction Water Sources

This CWMP has identified preferred construction water sources based on the latest available information available based on the water supply technical investigation and Stakeholder consultation as follows.

Table 7 Preferred Construction Water Sources

Proximal Location/ Activity / Aspect	Latitude/ Longitude	Property ID(s)	Source Description	Ancillary Infrastructure requirements	Water Take Estimate (operating envelope)	Approval Requirement
Substation - Mulgrave	*TBC*	CU4 F105A	*TBC - Final location of substation under review*	*TBC - Final location of substation under review*	*Expected pump rate = Source TBC* Maximum take = 159ML	*TBC - Final location of substation under review*
Substation - Pentland	*TBC*	CU3 L018A	*TBC - To be reviewed with CHRC - additional alignment groundwater bores may be required*	*TBC - To be reviewed with CHRC - additional alignment groundwater bores may be required*	*Expected pump rate = Source TBC* Maximum take = 66ML	*TBC - To be reviewed with CHRC - additional alignment groundwater bores may be required*
Substation - Flinders	*TBC*	CU3 L018A	Flinders Shire Council supply - exact stand-pipe locations to be confirmed	Flinders Regional Council supply - exact stand-pipe locations to be confirmed	*Expected pump rate = Source TBC* Maximum take = 157ML	FSC water supply agreement to be in place
Substation - Dajarra Road	*TBC*	CU7 L075B	*TBC - To be reviewed with CSC - additional alignment groundwater bores may be required*	*TBC - To be reviewed with CSC - additional alignment groundwater bores may be required*	*Expected pump rate = Source TBC* Maximum take = 67ML	*TBC - To be reviewed with CSC - additional alignment groundwater bores may be required*
Substation - Mt Isa	*TBC*	CU8 L080A	*TBC - To be reviewed with MICC - additional alignment groundwater bores may be required*	*TBC - To be reviewed with MICC - additional alignment groundwater bores may be required*	*Expected pump rate = Source TBC* Maximum take = 74ML	*TBC - To be reviewed with MICC - additional alignment groundwater bores may be required*

Proximal Location/ Activity / Aspect	Latitude/ Longitude	Property ID(s)	Source Description	Ancillary Infrastructure requirements	Water Take Estimate (operating envelope)	Approval Requirement
TL - Stage 4 MLG-PTL_1 to MLG-PTL_45	-19.96701, 146.9159	CU4 F105A CU2 L001 CU4 F104 CU3 L002	TLTB01 - new groundwater bore (nominal 60m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated) Monitoring Bore may be required	Expected pump rate = 4-6 L/s Maximum take = 17ML	Water Permit Exemption
TL - Stage 4 MLG-PTL_45 to MLG-PTL_92	-19.94311, 146.8259	CU3 L003 CU8 L080 CU3 L002	TLTB03 - new groundwater bore (nominal 60m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated) Monitoring Bore may be required	Expected pump rate = 4-6 L/s Maximum take = 17ML	Water Permit Exemption
TL - Stage 4 MLG-PTL_92 to MLG-PTL_139	-20.0182, 146.7077	CU3 L007 CU3 L006 CU3 L004 CU3 L005 CU3 L003	TLTB05 - new groundwater bore (nominal 60m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated) Monitoring Bore may be required	Expected pump rate = 4-6 L/s Maximum take = 18ML	Water Permit Exemption
TL - Stage 4 MLG-PTL_139 to MLG-PTL_184	-20.19789, 146.39256	CU3 F010 CU3 L009 CU3 L007	TLTB07 - new groundwater bore (nominal 60m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated) Monitoring Bore may be required	Expected pump rate = 4-6 L/s Maximum take = 18ML	Water Permit Exemption
TL - Stage 4 MLG-PTL_184 to MLG-PTL_230	-20.23877, 146.31823	CU3 F011 CU3 L012 CU3 F013	TLTB09 - new groundwater bore (nominal 60m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated) Monitoring Bore may be required	Expected pump rate = 4-6 L/s Maximum take = 18ML	Water Permit Exemption
TL - Stage 4 MLG-PTL_230 to MLG-PTL_274	-20.36667, 146.02277	CU3 F013 CU3 L015	TLTB10 - new groundwater bore (nominal 60m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated) Monitoring Bore may be required	Expected pump rate = 4-6 L/s Maximum take = 17ML	Water Permit Exemption

Proximal Location/ Activity / Aspect	Latitude/ Longitude	Property ID(s)	Source Description	Ancillary Infrastructure requirements	Water Take Estimate (operating envelope)	Approval Requirement
TL - Stage 4 MLG-PTL_274 to MLG-PTL_317	-20.49439, 145.85242	CU3 L015 CU3 L016 CU3 L017A CU3 F017	TLTB11 - new groundwater bore (nominal 100m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated)	Expected pump rate = 6-10 L/s Maximum take = 19ML	Water Permit Exemption
TL - Stage 4 MLG-PTL_317 to PTL-FLR_8	-20.61563, 145.61246	CU3 F017 CU3 L018A	TLTB12 - new groundwater bore (nominal 60m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated)	Expected pump rate = 6-10 L/s Maximum take = 19ML	Water Permit Exemption
TL - Stage 4 PTL-FLR_8 to PTL-FLR_51	-20.71378, 145.48583	CU3 L019 CU3 L018A	TLTB13 - new groundwater bore (nominal 150m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated)	Expected pump rate = 6-10 L/s Maximum take = 28ML	Water Permit Exemption
TL - Stage 4 PTL-FLR_51 to PTL-FLR_97	-20.81112, 145.25128	CU4 L020 CU3 L019	TLTB15 - new groundwater bore (nominal 150m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated)	Expected pump rate = 6-10 L/s Maximum take = 31ML	Water Permit Exemption
TL - Stage 4 PTL-FLR_97 to PTL-FLR_140	-20.87018, 145.05506	CU4 F021 CU4 L020	TLTB16 - new groundwater bore (nominal 175m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated)	Expected pump rate = 8-12 L/s Maximum take = 28ML	Water Permit Exemption
TL - Stage 4 PTL-FLR_140 to PTL-FLR_184	-20.89, 144.801	CU4 F021 CU4 F022 CU4 L023 CU4 F025	RN184785 (230m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated)	Expected pump rate = 6-10 L/s Maximum take = 29ML	Water Permit Exemption
TL - Stage 4 PTL-FLR_184 to PTL-FLR_227	-20.938, 144.604	CU4 F025 CU4 F024 CU4 L026	RN163820 (276m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated)	Expected pump rate = 6-10 L/s Maximum take = 29ML	Water Permit Exemption
TL - Stage 4 PTL-FLR_227 to PTL-FLR_272	-20.901, 144.234	CU4 F028 CU4 F027	RN3006 (200m depth)	Turkeys nest or Tank required (reserve to supplement lower yield to the east)	Expected pump rate = >12 L/s Maximum take = 28ML	Water Permit Exemption

Proximal Location/ Activity / Aspect	Latitude/ Longitude	Property ID(s)	Source Description	Ancillary Infrastructure requirements	Water Take Estimate (operating envelope)	Approval Requirement
TL - Stage 1 PTL-FLR_272 to FLR-DJR_33	-20.907, 144.096	CU4 F032 CU4 L031 CU4 L030 CU4 F094A CU4 F094 CU4 F028	RN3003 (394m depth)	Mobile tank likely to be used during peak draw times	Expected pump rate = >12 L/s Maximum take = 20ML	Water Permit Exemption
TL - Stage 1 FLR-DJR_33 to FLR-DJR_77	-20.929, 143.886	CU4 F032 CU4 L033 CU4 L034	RN69957 (341m depth)	Mobile tank likely to be used during peak draw times	Expected pump rate = 6-10 L/s Maximum take = 17ML	Water Permit Exemption
TL - Stage 1 FLR-DJR_77 to FLR-DJR_124	-20.886, 143.691	CU4 L035 CU4 L034	RN118268 (458m depth)	Mobile tank likely to be used during peak draw times	Expected pump rate = 6-10 L/s Maximum take = 18ML	Water Permit Exemption
TL - Stage 1 FLR-DJR_124 to FLR-DJR_167	-20.876, 143.355	CU5 L037 CU4 F036 CU4 L035	RN3591 (524m depth)	Mobile tank likely to be used during peak draw times	Expected pump rate = >12 L/s Maximum take = 17ML	Water Permit Exemption
TL - Stage 1 FLR-DJR_167 to FLR-DJR_214	-20.867, 143.238	CU5 L040 CU5 L039 CU5 L038	RN163807 (488m depth)	Mobile tank likely to be used during peak draw times	Expected pump rate = >12 L/s Maximum take = 18ML	Water Permit Exemption
TL - Stage 1 FLR-DJR_214 to FLR-DJR_262	-20.84349, 142.94684	CU5 L040 CU5 L041 CU5 F042B CU5 F042A CU5 L043	TLTB24 - new groundwater bore (nominal 500m depth)	Mobile tank likely to be used during peak draw times	Expected pump rate = >12 L/s Maximum take = 18ML	Water Permit Exemption
TL - Stage 1 FLR-DJR_262 to FLR-DJR_303	-20.798, 142.7	CU5 L045 CU5 L044A CU5 L043	RN146292 (448m depth)	Mobile tank likely to be used during peak draw times	Expected pump rate = >12 L/s Maximum take = 17ML	Water Permit Exemption

Proximal Location/ Activity / Aspect	Latitude/ Longitude	Property ID(s)	Source Description	Ancillary Infrastructure requirements	Water Take Estimate (operating envelope)	Approval Requirement
TL - Stage 1 FLR-DJR_303 to FLR-DJR_348	-20.812, 142.549	CU5 L047 CU5 L046 CU5 L045	RN118981 (546m depth)	Mobile tank likely to be used during peak draw times	Expected pump rate = >12 L/s Maximum take = 18ML	Water Permit Exemption
TL - Stage 1 FLR-DJR_348 to FLR-DJR_392	-20.79397, 142.14817	CU6 L049 CU6 L048 CU5 L047	TLTB25 - new groundwater bore (nominal 475m depth)	Mobile tank likely to be used during peak draw times	Expected pump rate = >12 L/s Maximum take = 17ML	Water Permit Exemption
TL - Stage 1 FLR-DJR_392 to FLR-DJR_437	-20.7988, 141.98462	CU6 L053 CU6 L051 CU6 L050	TLTB26 - new groundwater bore (nominal 400m depth)	Mobile tank likely to be used during peak draw times	Expected pump rate = >12 L/s Maximum take = 18ML	Water Permit Exemption
TL - Stage 2 FLR-DJR_437 to FLR-DJR_490	-20.72931, 141.76573	CU4 L106 CU4 L109 CU6 L053	TLTB27 - new groundwater bore (nominal 400m depth)	Mobile tank likely to be used during peak draw times	Expected pump rate = >12 L/s Maximum take = 19ML	Water Permit Exemption
TL - Stage 2 FLR-DJR_490 to FLR-DJR_533	-20.713, 141.647	CU4 F111 CU4 L106	RN93472 (357m depth)	Mobile tank likely to be used during peak draw times	Expected pump rate = 6-10 L/s Maximum take = 18ML	Water Permit Exemption
TL - Stage 2 FLR-DJR_533 to FLR-DJR_578	-20.793, 141.479	CU6 L056 CU6 F055A CU6 F055B CU4 F111	RN16242 (305m depth)	Mobile tank likely to be used during peak draw times	Expected pump rate = 6-10 L/s Maximum take = 18ML	Water Permit Exemption
TL - Stage 2 FLR-DJR_578 to FLR-DJR_622	-20.7841, 141.21541	CU6 F058 CU6 L057 CU6 L056	TLTB28 - new groundwater bore (nominal 300m depth)	Mobile tank likely to be used during peak draw times	Expected pump rate = 6-10 L/s Maximum take = 18ML	Water Permit Exemption
TL - Stage 2 FLR-DJR_622 to FLR-DJR_666	-20.7763, 141.0204	CU7 L061 CU7 L060 CU6 F059 CU6 F058	TLTB29 - new groundwater bore (nominal 225m depth)	Mobile tank likely to be used during peak draw times	Expected pump rate = 6-10 L/s Maximum take = 18ML	Water Permit Exemption

Proximal Location/ Activity / Aspect	Latitude/ Longitude	Property ID(s)	Source Description	Ancillary Infrastructure requirements	Water Take Estimate (operating envelope)	Approval Requirement
TL - Stage 2 FLR-DJR_666 to FLR-DJR_713	-20.755, 140.741	CU7 L061 CU7 L071 CU7 L063	TLTB30 - new groundwater bore (nominal 75m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated)	Expected pump rate = 6-10 L/s Maximum take = 18ML	Water Permit Exemption
TL - Stage 2 FLR-DJR_713 to FLR-DJR_751	-20.75368, 140.48228	CU7 L075B CU7 L075A CU7 L075 CU7 L064 CU7 L062 CU7 L063	TLTB32 - new groundwater bore (nominal 100m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated)	Expected pump rate = 6-10 L/s Maximum take = 15ML	Water Permit Exemption
TL - Stage 3 FLR-DJR_751 to DJR-MTI_48	-20.763, 140.277	CU7 L075A CU7 L063	TLTB33 - new groundwater bore (nominal 100m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated)	Expected pump rate = 6-10 L/s Maximum take = 16ML	Water Permit Exemption
TL - Stage 3 DJR-MTI_48 to DJR-MTI_99	-20.79209, 140.0869	CU7 L077 CU7 L076 CU7 L075A	TLTB34 - new groundwater bore (nominal 100m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated)	Expected pump rate = 6-10 L/s Maximum take = 18ML	Water Permit Exemption
TL - Stage 3 DJR-MTI_99 to DJR-MTI_147	-20.7697, 139.8836	CU7 L077	TLTB35 - new groundwater bore (nominal 100m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated)	Expected pump rate = 6-10 L/s Maximum take = 18ML	Water Permit Exemption
TL - Stage 3 DJR-MTI_147 to DJR-MTI_200	-20.77818, 139.60977	CU8 L080A CU8 L080 CU8 F079 CU7 L077	TLTB36 - new groundwater bore (nominal 100m depth)	Turkeys nest or Tank required (lower than target flow rate anticipated)	Expected pump rate = 6-10 L/s Maximum take = 18ML	Water Permit Exemption

Appendix A List of Water Investigation Reports

Please note, the following reports have previously been submitted to Powerlink and are listed here for reference only.

Location	Document Title
Charters Towers Camp	CSPW-CON-RPT-900-000002_A_Charters Towers Camp Water Supply
Cloncurry Camp	CSPW-CON-RPT-900-000003_A_Cloncurry Camp Water Supply
Hughenden Camp	CSPW-CON-RPT-900-000004_A_Hughenden Camp Water Supply
Julia Creek Camp	CSPW-CON-RPT-900-000005_A_Julia Creek Camp Water Supply
Pentland Camp	CSPW-CON-RPT-900-000006_A_Pentland Camp Water Supply
Richmond Camp	CSPW-CON-RPT-900-000007_A_Richmond Camp Water Supply
Summary of Desktop Analysis	CSPW-CON-RPT-900-000008_A_Summary of Desktop Analysis (Stages 1 & 2)
Summary of Desktop Analysis	CSPW-CON-RPT-900-000009_A_Summary of Desktop Analysis (Stages 1 & 2)_Optimized
Charters Towers to Pentland	CSPW-CON-RPT-900-000010_A_Transmission Line Water Supply - Charters Towers to Pentland
Cloncurry to Mt Isa	CSPW-CON-RPT-900-000011_A_Transmission Line Water Supply - Cloncurry to Mt Isa
Hughenden to Richmond	CSPW-CON-RPT-900-000012_A_Transmission Line Water Supply - Hughenden to Richmond
Julia Creek to Cloncurry	CSPW-CON-RPT-900-000013_A_Transmission Line Water Supply - Julia Creek to Cloncurry
Pentland to Hughenden	CSPW-CON-RPT-900-000014_A_Transmission Line Water Supply - Pentland to Hughenden
Richmond to Julia Creek	CSPW-CON-RPT-900-000015_A_Transmission Line Water Supply - Richmond to Julia Creek
Woodstock to Charters Towers	CSPW-CON-RPT-900-000016_A_Transmission Line Water Supply - Woodstock to Charters Towers

COPPERSTRING 2032

COPPERSTRING 2032 JV

WASTE MANAGEMENT PLAN

COPPERSTRING 2032

EDMS No : CSPW-EVN-PLN-900-000007
Revision : A02
Date : 17/06/2024

IFR

Approvals and Reviews

Waste Management Plan	
Project	CopperString 2032
Client	Powerlink Queensland Pty Ltd
Document Number	CSPW-EVN-PLN-900-000007

Revision History

Rev No.	Description of Revision	By	Checked	Approved	Date
A01	Developed for PDLA Work Contract	Padma Cuppala	David Mclean	Matt Lennon	03/05/2024
A02	Incorporated PQ feedback received on 31 May 2024	Padma Cuppala	Jacinta Fuller	Matt Lennon	17/06/2024

This plan has been developed by UGL CPB JV to define the management objectives and practices that are to be implemented during the execution of Contract activities. It is the private property of the JV and without their consent must not be shown or given to any competitor or third parties or used by the recipient for purposes other than those for which they are issued. Any printed documents shall be considered as uncontrolled.

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Appendices

Appendix A Initial Waste Assessment
Appendix B Council Landfill Facilities
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1. Introduction

The purpose of the CopperString 2032 project is to connect the North West Minerals Province (NWMP) of Queensland to the National Electricity Grid. This will not only allow existing loads in the Mount Isa and Cloncurry areas to be fed from the National Electricity Market (NEM), but also provide access to new mining loads and opportunity for connection of renewable generation.

1.1 Project scope

The CopperString 2032 Project is an extra high voltage transmission system intended to connect the North West Power System (NWPS) near Cloncurry and Mount Isa to the Powerlink network and NEM at Mulgrave. Figure 1 provides an overview of the Project.



Figure 1: CopperString 2032 proposed transmission lines and substations

The CopperString 2032 Project will connect the NWMP to the NEM to reduce the cost of power supply and facilitate the large-scale development of the Hughenden wind resource and solar resources within the North Queensland Clean Energy Hub (NQCEH).

The scope of work, traversing east to west, consists of the following sections:

- Mulgrave 500/275kV Substation as the CopperString 500kV connection point to the Queensland SuperGrid and 275kV line augmentation as the CopperString 275kV connection point to the NEM
- Pentland 500kV Substation to support the North Queensland Clean Energy Hub (NQCEH) expansion and as the core for future load connections in the area
- Flinders 500/300kV Substation (Hughenden) as the core for the NQCEH
- Dajarra Road 330/220kV Substation (Cloncurry) as the core for distributions to larger load centres
- The primary CopperString transmission backbone
- Termination via the Mount Isa augmentation 220/132kV.

The scope consists of a transmission line between the above locations carrying extra high voltage power transmission at 500kV, 330kV and 220kV respectively. Substations at the abovementioned interconnecting junctions will distribute power to the NWMP and NQCEH.

The project scope, from a waste perspective includes:

- Waste generation from procurement, design and construction methodology
- Waste storage at transit and temporary hubs

- Waste handling in accordance with end use arrangements and legal requirements
- Waste measuring and reporting.

1.2 Abbreviations, acronyms and definitions

The following table lists the acronyms used in this plan, including their definitions.

Table 1 Abbreviations, acronyms & definitions

Term	Definition
CEMP	Construction Environmental Management Plan
PQ	Powerlink Queensland
the JV	UGL CPB Joint Venture
the Project	CopperString 2032
JV Project area	Extends from Townsville to Mount Isa across Local Government areas
Contaminated Land	Contaminated Land means land or matter in or on the land that is affected by a hazardous substance so that it is, or causes other land, water and air to be a hazard to human health or to the environment. Matter is interpreted to include: • Surface waters • Groundwater • Soil gases. Contaminated land may include contaminated soil or waters impacted by the project as a result of spills, for example.
Council	Local Government Authorities in the Project area
EIS	Environmental Impact Statement
EMF	Environmental Management Framework
EP Act	*Environmental Protection Act 1994*
Generator	A generator is often a commercial or industrial organisation which produces or stores trackable regulated waste and arranges for this waste to be sent for storage, recycling, treatment or disposal at another location via an authorised transporter
MID	Ministerial Infrastructure Designation
NEM	National Electricity Market
NQCEH	North Queensland Clean Energy Hub
NWMP	North West Minerals Province
NWPS	North West Power System
Regulated Waste	Defined in s42 of the EP Regulation and is commercial or industrial waste, whether or not it has been immobilised or treated; and is of a type, or contains a constituent of a type, mentioned in Schedule 9 part 1 of the regulation and includes for an element—any chemical compound containing the element; and anything that contains residues of the waste
Trackable waste	A regulated waste of a type mentioned in Schedule 11 of the EP Regulation to which the waste tracking provisions of the regulation apply
WMP	Waste Management Plan (this plan)
WRRA	*Waste Reduction and Recycling Act 2011*

2. Interface with Environmental Management Framework

This Waste and Refuse Disposal Management Plan, hereafter referred to the Waste Management Plan (WMP) is a technical Sub Plan of the project's Construction Environmental Management Plan (CEMP) identified in the below Environmental Management Framework (EMF).

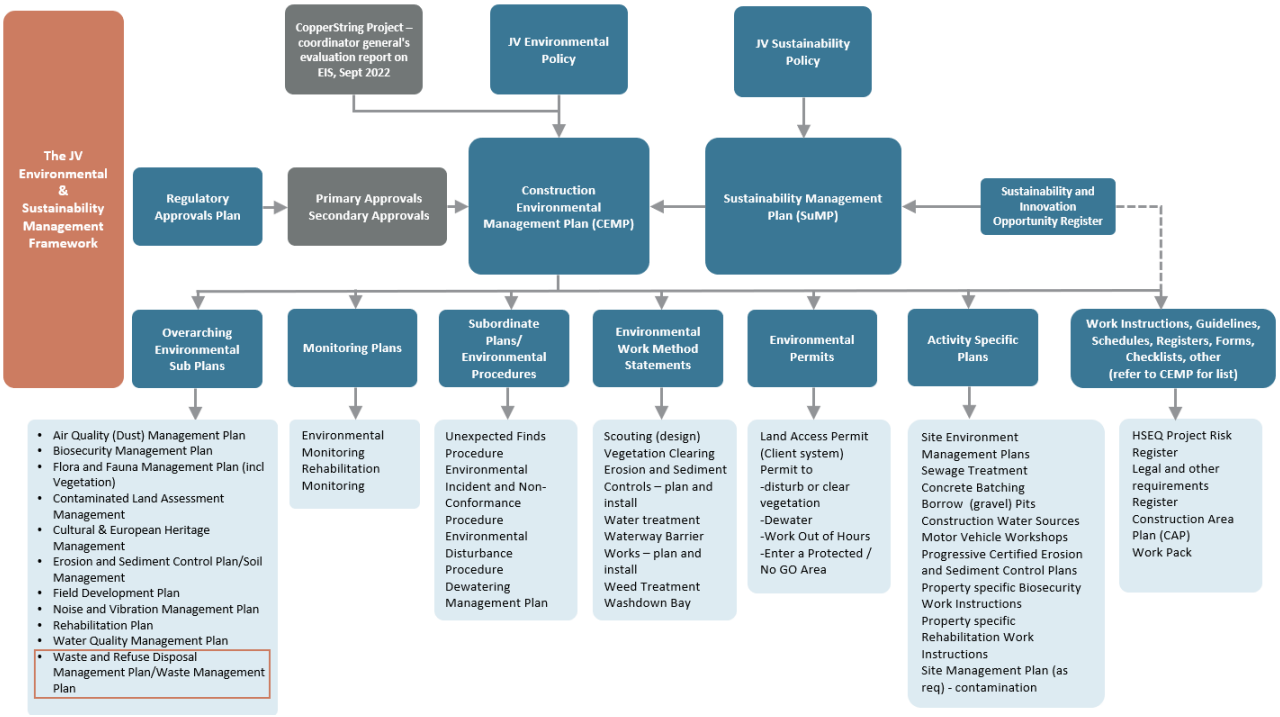


Figure 2: Environmental Management Framework - WMP Interface

2.1 Plan purpose

This version of the WMP has been prepared to provide details on how waste requirements will be met during the project's construction phase, including identifying any secondary impacts that may warrant further assessment and opportunities to achieve higher order waste hierarchy solutions for individual waste streams.

In order to achieve this purpose, this WMP:

- Estimates waste streams (types and volumes) associated with key construction stages and tracks the lifecycle of the waste based in accordance with the waste management hierarchy.
- Prescribes the process for the management of waste during procurement, delivery and demobilisation, including waste storage, partnering with local businesses for effective waste management.
- Summarises the comprehensive reporting process in alignment with the CEMP waste management objectives.

This WMP has been developed to meet the project scope, address known conditions and commitments to date and refine the waste management approach provided to date.

2.2 Plan scope

This WMP addresses planned waste generated during construction and considers previous information provided in the project's Environmental Impact Statement (EIS), and waste requirements in the projects:

- The Construction Environmental Management Plan (CEMP), prepared by the Joint Venture in response to the:
  - Coordinator General's Report on the EIS (date September 2022)
  - EIS Volume 2 – Chapter 12 – Waste Management, inclusive of previous versions of this WMP.

Table 2 summaries the waste management requirements that are relevant to the project and cross references to where they have been addressed in this plan.

Table 2 Waste requirements

Source	Requirement	Cross Reference
Construction Environmental Management Plan – Section 18.10	Update the Waste and Refuse Disposal Management Plan (prepared as part of the EIS), otherwise known as the Waste Management Plan (WMP) to identify, in consultation with local waste service providers, the following:	This WMP
	• Waste types	Section 4.1 Appendix A
	• Waste volume estimates for each waste type (having regard to accommodation hub waste assessments)	Section 4.1 Appendix A
	• Waste storage requirements insitu	Section 4.1 Appendix A
	• Waste management requirements as per the waste management hierarchy	Section 4.1 Appendix A
	• Waste disposal coordination plan to identify locally available disposal and recycling options for various wastes for each Local Government Area (including stakeholder consultation with landholders, community groups, Councils and local waste service providers)	Section 4.1 Appendix A
	• Waste transport requirements	Section 4.4
	• Waste procedure for the management of waste (including any health and safety requirements for hazardous materials)	Section 4.4 Appendix C
	• Waste records and reporting.	Section 4.6

CoG evaluation report - Appendix 2 Part A, Recommended information requirements for MID request
Recommendation No. 4
	Recommendation 4:
	Any MID requests(s) must include a report on outcomes of consultation with relevant local government councils. This report should detail:
	• *Preferred worker accommodation arrangements with each council, including:*
	  ○ *Location of accommodation, and whether this requires construction of a new facility or upgrade/use existing facility*
	  ○ *Appropriate servicing arrangements for the facility/facilities*
	  ○ *Detail induction arrangements for each location to address potential impacts on local communities*
	• *Waste disposal arrangements where use of council waste facilities has been agreed.*
		Section 4.1
		End uses for waste streams identified in this WMP requires ongoing consultation

CoG evaluation report - Appendix 2 Part B, Construction management, Recommended Condition 33(a)(viii)(xii)	*Part B 33(a)* *Prior to the commencement of works, prepare and submit a Construction Environmental Management Plan (CEMP) to DSDILGP (infrastructuredesignation@dsdmip.qld.gov.au). The CEMP must be consistent with management measures detailed in the project EIS and, and must include/address the following:*	This WMP will form part of the CEMP, revised during detailed design. Appendix A Section 4.6 Stakeholder consultation with Councils regarding disposal at preferred locations will continue to be undertaken during MID submission and ongoing during detailed design
	Part B 33 (viii): *a waste management plan detailing:* • *Preference of waste management in the following order –avoid or reduce, reuse, recycle, recover, treat and dispose* • *How each waste stream is to be stored, transported, and disposed of* • *Estimated quantities of waste from each waste stream* • *Details of waste transport companies to be utilised and copies of any relevant licenses* • *Reporting on consultation with relevant councils regarding disposal at existing council facilities* • *Details of waste disposal facilities to be utilised and copies of any relevant licenses and waste acceptance criteria*	

Source	Requirement	Cross Reference
	Part B 33(xii): *a Hazard, Health and Safety Management Plan detailing disposal and management of hazardous materials and regulated waste, including removal by a suitably licensed contractor where deemed necessary.*	Section 4.4 Appendix C
CoG Evaluation Report – Appendix 2, Part B, Operation management Recommended Condition 35 (a) (ix)	*PART B35 (a)Prior to commencement of operation, prepare and submit an OEMP to DSDILGP (infrastructuredesignation@dsdmip.qld.gov.au). The OEMP must be consistent with management measures detailed in the project EIS and should include, at a minimum, the below sub-plans:*	OEMP to be developed by PQ. JV to provide support.
	Part B35(ix) Waste Management Plan	
CoG Evaluation Report – Appendix 4, Chapter 7 Flora and fauna, Proponents Commitments Condition C66	*C66: A Waste management procedure will be prepared as part of the CEMP. These will detail the location and specifications for disposal and removal of waste from the construction site. Responsible waste management practices (e.g., not leaving out food waste and not feeding wildlife) will be implemented and followed by all construction personnel. All waste will be stored in secure temporary holding containers and transported offsite.*	Section 4.4 Appendix C Section 5
CoG Evaluation Report – Appendix 4, Chapter 12 Waste management Proponents Commitments Condition C95 to C98	*C95: Waste will be dealt with following the waste management hierarchy, where avoidance of waste generation is the most desirable course of action and disposal of waste is the least desirable course of action.*	Appendix A (this plan)
	C96: Waste generation will primarily be mitigated and managed by reducing (avoiding), recycling and reusing. All waste is expected to be transported to external licensed waste management facilities; these will be determined during the MID process.	Section 4.2
	C97: *Waste management procedures will be prepared as part of the CEMP that will include specific measures for storing, transporting and disposing of wastes developed in consultation with operators of local waste management facilities.*	
	C98: *Where necessary, restricted invasive plants material will be disposed of in accordance with the biosecurity measures in the CEMP.*	
CoG Evaluation Report – Appendix 4, Chapter 19 Environmental Management Proponents Commitments Condition 153a	*C153a: As part of the Project, various overarching management plans will be developed and implemented in relation to the broader environmental aspects for the Project* • … • Waste and Refuse Disposal Management Plan • …	This WMP
CoG Evaluation Report – Appendix 4, Chapter 19 Environmental Management Proponents Commitments Condition 153b	*C153b: As part of the Construction Environmental Management Plan, various sub-plans will be developed and implemented in relation to the environmental aspects for the Project* • …. • Waste Management • …	This WMP
CoG Evaluation Report – Appendix 4, Chapter 19 Environmental Management Proponents Commitments Condition 153c	*C153c: As part of the Operational Environmental Management Plan, various sub-plans will be developed and implemented in relation to the environmental aspects* • … • … • Waste Management Plan	OEMP to be developed by PQ. JV to provide support.
CoG Evaluation Report – Appendix 4, Chapter 19	*C158: CopperString is committed to ensuring that:* • *Environmental harm and pollution is minimised through the active identification and management of environmental risks;*	CEMP and this Plan

Source	Requirement	Cross Reference
Environmental Management Proponents Commitments Condition 158	• *Ensuring the efficient use of resources, recycling of materials and reduction of waste;* • *Compliance is maintained with relevant environmental legislation, regulation and standards as well as project approval conditions* • *An environmental management system is implemented that is developed in accordance with AS/NZS ISO 14001* • *Regular review and analysis of environmental performance is undertaken to identify and implement continual improvement.*	

2.2.1 Exclusions

This WMP does not address the following.

- Contaminated land management, to be addressed in an activity specific plan if required, dependent on the findings of the baseline contamination sampling at sites listed on the Queensland's Environmental Management Register/Contaminated Land Register (EMR/CLR) during early works
- Asbestos, addressed through safety legislation (note, disposal of hazardous substances will be managed as a regulated waste as defined herein)
- Unexpected finds in relation to contamination.

2.2.2 Limitations

This WMP has been updated without:

- Waste service provider procurement processes completed although early consultation with key waste providers in the region has informed the waste strategies currently feasible
- Formal consultation with recycling end users to ensure capacity and logistic opportunities including onsite recycling initiatives
- Full consultation with relevant Stakeholders, which is ongoing as part of the MID process and is planned during detailed design with Local Government authorities and the relevant community.

2.3 Objectives

UGL CPB JV's (the JV) waste management objectives include:

- Minimising the total amount of waste sent to landfill by adopting higher order/preferable solutions, refer to Section 3 on the waste and resource recovery hierarchy adopted
- Compliance with all legal obligations pertaining to waste management and disposal.

2.3.1 Legal obligations

This WMP has been developed having regard to legal obligations identified in the below regulatory framework.

- *Environmental Protection Act 1994* (EP Act)
- *Environmental Protection Regulation 2019* (EP Regulation)
- *Waste Reduction and Recycling Act 2011* (WRRA)
- *Queensland Waste and Resource Recovery Strategy* (the Strategy)
- *Queensland Plastic Pollution Reduction Plan* (the Plastics Plan)
- *Queensland Organics Strategy 2022-2032* (the Organics Strategy).

Legal requirements considered in the preparation of this WMP include:

- Environmental authority licensing requirements for waste transport pursuant to the EP Act
- Regulated waste and waste that is not regulated waste in Schedule 9 of the EP Regulation
- Trackable waste and waste codes in Schedule 11 of the EP Regulation
- Prescribed information for waste tracking in Schedule 12 of the EP Regulation
- Solid Concrete Washout (ENEW07602819) End of Waste Code (EOWC), pursuant to the WRRA, where excess concrete is managed by the concrete manufacturer

- Illegal dumping of waste provision (Section 104 of the WRRA), where excess concrete is managed by the Principal Contractor which states:

  "(1) A person must not illegally dump waste at a place.

  Maximum penalty— (a) if the offence involves depositing a volume of less than 2,500L of waste—400 penalty units; or (b) if the offence involves depositing a volume of 2,500L or more of waste—whichever is the greater of the following amounts— (i) 1,000 penalty units; (ii) a fine that is twice the waste levy amount that would have been payable, when the waste was dumped, by the operator of a leviable waste disposal site if the waste had been delivered to the site

  (2) For subsection (1), a person illegally dumps waste at a place if the person deposits at the place an amount of waste that is 200L or more in volume.

  (3) However, a person who deposits at a place an amount of waste of 200L or more in volume (the relevant waste) does not illegally dump the relevant waste if— (a) the person is an occupier of the place; or (b) the person deposits the relevant waste with the consent of an occupier of the place; or (c) the person deposits the waste by placing it in a bin or other container provided by an occupier of the place, or by another person with the agreement of an occupier, for the purpose of depositing the relevant waste".

2.4 Revising this plan

This WMP will be revised as follows.

- During detailed design when waste streams (types and/or volume) are significantly changed, or end uses are deemed unfeasible, to ensure currency in the waste assessment process prior to construction.
- Post stakeholder consultation where expectations and agreements on waste are different to the planned approach.
- In response to regulatory approvals that identify specific requirements for the management of waste.
- During construction as logistics and risks are more understood and specific mitigation measures are required in order to achieve the objectives of this Plan.

3. Waste Management Hierarchy

This WMP adopts the Waste and Resource Management Hierarchy (refer to Figure 4) underpinning the States waste management strategy: *Waste Management and Resource Recovery Strategy for Queensland* (the Strategy). This commitment has been documented in the project's Sustainability Management Plan (0643-JV-PLN-SMP-0023) reflective of the Client being a government entity. The waste hierarchy focuses on waste reduction, reuse and recycling as preferable to waste disposal.

Waste, for purposes of this Plan, is defined in accordance with Section 13(1) of the EP Act as "*anything that is:*

- *Left over, or an unwanted by-product, from an industrial, commercial, domestic, or other activity.*
- *Surplus to the industrial, commercial, domestic, or other activity generating the waste".*

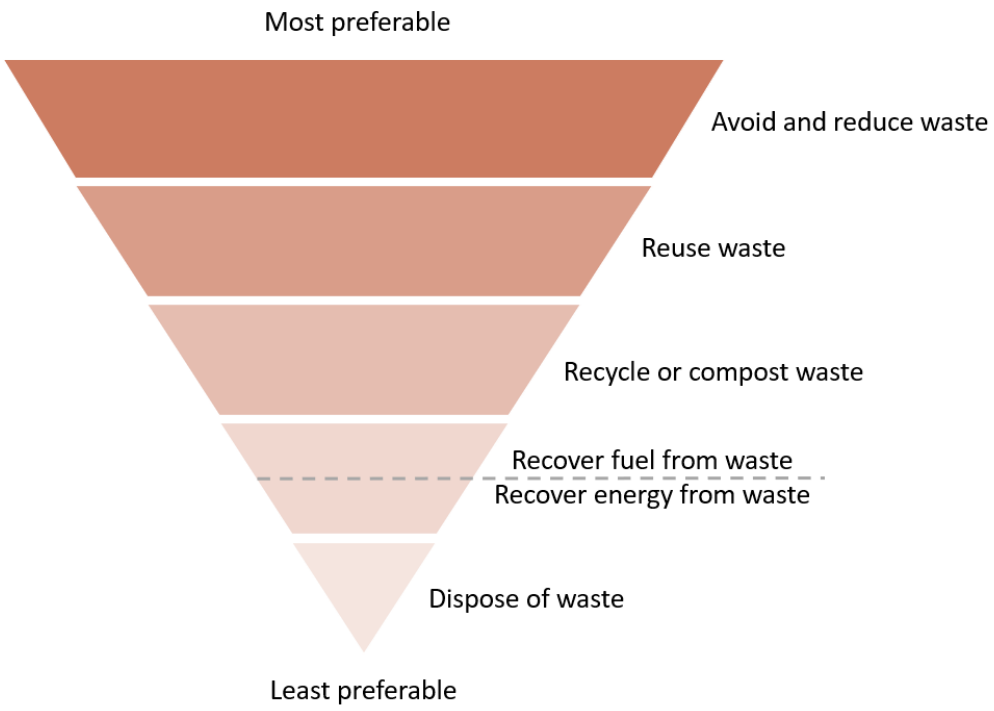


Figure 3 CopperString 2032 Adopted Waste and Resource Management Hierarchy

3.1 Evaluation of waste impacts

Waste impacts associated with construction of this project have been assessed as either direct or indirect as follows in order to support the implementation of the waste management hierarchy. Direct waste impacts can result from (including but not limited to):

- Poor planning and stakeholder engagement
- Littering
- Incorrect classification of wastes
- Unlawful handling of wastes
- Non-segregation/mixing of wastes
- Excess procurement and materials packaging
- Lower order waste hierarchy solutions based on cost savings as the key decision criteria
- Non-balanced earthworks
- Lack of quality control during materials storage
- Lack of awareness
- Waste generating behaviours/culture and unplanned trends not identified early for intervention
- Low waste goal setting
- Inefficient construction methods
- Spillage during transport
- Landfill footprint consumption
- Increased leachate

Indirect impacts may include (but not limited to):

- Increased Scope 1 greenhouse gas emissions (requiring offset by the project)
- Reduction in local waste services (e.g., sewage treatment plant and landfill capacity issues)

- Increased traffic.

Indirect impacts may also be positive such as:

- Increased community awareness
- Improvements to local waste facilities through project spend
- Leading by example by supporting commercial recycling opportunities to expand regionally.

4. Plan Implementation Approach

In order to implement the requirements of the strategy and meet legal obligations, this WMP details:

- Initial waste volumes based on the nature, scale, and intensity of the project per construction stage
- Identifies preferred end use outcomes for all waste streams as part of the initial assessment, subject to:
  - Proposed Stakeholder consultation
  - Partnering arrangements with the local business community
  - Feasibility assessments during detailed design
- Planning protocol in place to avoid/minimise waste generation inclusive of:
  - Procurement strategies
  - Environment in Design processes
  - Construction strategies to reduce excess waste and
  - Feasibility assessment criteria for deviating from the Plan
- Requirements for onsite storage area and design, including management controls
- Approach to subcontractor management for the onboarding and ongoing use of a waste service provider(s)
- Waste tracking/measuring and reporting processes.

4.1 Initial waste assessment

An initial waste assessment has been developed that identifies the following.

- Waste streams per construction stage or activity type (either early work, access, camp construction, office uses, camp occupation, sewage treatment, water treatment, civil works, road works, motor vehicle workshop, concrete batching, fuel storage, tower foundations, tower assembly and erection, stringing, substations, rehabilitation, and de-mobilisation)
- Waste category (either regulated or non-regulated waste for purpose of legal compliance planning)
- Sources of each waste stream
- Whether the waste is solid or liquid
- The location of the waste source generation (either use of existing infrastructure, alignment, substations, or accommodation hubs)
- Estimate of volume, in either weight or volume units or as a waste type to be converted to a weight based on weight factors and a conversion calculator)
- Calculation assumptions
- Proposed end use based on the adopted waste hierarchy (either reuse, recycle, recover, dispose, or leave *insitu*), refer to Section 4.3 with the avoid/reduce measures addressed in the Waste Planning Protocol (refer to section 4.4)
- Storage requirements
- Onsite treatment (applicable for where reuse is the preferred end use)
- End use location, based on known opportunities and constraints.

Refer to **Appendix A for the initial waste stream assessment in full**.

The initial waste assessment identifies higher order end uses for the majority of waste streams generated by the project as summarised in Table 3 below.

Table 3 Initial Waste Assessment summary of management strategies

Waste Streams	Management Strategy	
	End use	Strategy
Non-Regulated Waste		
General waste (putrescible) – inclusive of organic material or non-recyclable materials	Dispose	Avoid/minimise – Implement Waste Planning Protocol. Temporary storage onsite at dedicated waste storage area at accommodation hubs and substations. Transit holding locations will be required to collect and transport general waste from the transmission line. Disposal at landfill.
Organic liquid waste	Recycle	Segregate where feasible. Pulp to a slurry then temporarily store in a holding tank for vacuum truck collection offsite/mixing onsite. Subject to: • Proposed Stakeholder consultation • Partnering arrangements with the local business community • Feasibility assessments during detailed design.
Co-mingle recycling (remote locations only where segregation is not feasible)	Recycle	Implement at remote locations only, principally associated with satellite offices. Includes mixed plastics, cardboard and paper. Recycling facilities.
• Bottles & Cans • Plastics - Hard Plastic, corrugated. • Cardboard, paper • Paper • Recyclable Metals e.g. Ferrous and non - ferrous • Ark Planet Recycling Box options (printer cartridges, toner pack etc) •	Avoid or recycle	Avoid/minimise – Implement Waste Planning Protocol. Segregated containers. Temporary storage onsite at dedicated waste storage area at accommodation hubs and substations. Recycling facilities (e.g. waste transfer stations, resource recovery centres). May include option to bail/compress cardboard/plastics to reduce transport requirements.
• Bottles & Cans (10c eligible containers)	Recycle	10c eligible recyclable bottles& cans will be collected for local charity donations.
Timber (pallets, pegs, posts, excess formwork etc.)	Reuse	Avoid/minimise – Implement Waste Planning Protocol. Timber repurposing area for reuse as dunnage. Subject to: • Proposed Stakeholder consultation • Partnering arrangements with the local business community • Feasibility assessments during detailed design.
• ESC materials – sediment fencing, geofabric, coir logs other • Plastic strapping	Dispose	Disposal at landfill.
• Excess Concrete • Excess timber not reusable • Hessian bags • Office/donga fit out furniture • Safety materials	As per the waste planning protocol	Avoid/minimise – Implement Waste Planning Protocol. Concrete washout facilities on easement. Subject to: • Proposed Stakeholder consultation • Partnering arrangements with the local business community • Feasibility assessments during detailed design.
• Slurry (from pot holing/piling) • Drilling fluids (non-contaminated)	Reuse	May require dewatering/drying dependent on liquid waste facilities available.
• Vegetation matter • Used rock	Reuse	Stockpile/mulch on site. Leave *insitu*. Land maintenance/operational tracks (preferred outcome to disposal or washing for recycling offsite due to biosecurity risk).

Waste Streams	Management Strategy	
	End use	Strategy
Restricted matter (weeds)	Treat or dispose	• Pre-treat to kill weed matter prior to clearing, or • Segregate and bury on site, or • Dispose at landfill. Refer also to the biosecurity management plan
• Concrete wash water • Stormwater collections	Reuse	As per stormwater drainage strategy/evaporation in holding ponds. Reuse in concrete manufacturing. Reuse in dust suppression, subject to contamination testing. May require pH adjustment.
• Excess subsoil • Excess pavement materials • Unused aggregates/	Avoid	Implement Waste Planning Protocol.
Formwork reusable assets e.g., Dongas, buildings, tanks, washdown bays, shipping containers, batch plants etc.	Reuse	Implement Waste Planning Protocol.
• Recovered aggregates during rehabilitation • Spent HDPE (conduit/plastics/pipe)	Leave *insitu* or recycle	Subject to: • Proposed Stakeholder consultation • Partnering arrangements with the local business community • Feasibility assessments during detailed design.
Regulated Waste		
• Septic (sludge) • Clinical • Empty chemical containers • Water treatment plant spent media	Dispose	Disposal at landfill.
Sewage (effluent)	Treat (onsite) and dispose	Temporary storage at satellite offices using bulky bins, or on easement using portaloos, pumped and transferred to the nearest accommodation hub for treatment. Treat via onsite treatment plant prior to land based disposal where not connected to mains.
• Treated/bypass effluent (wastewater) not meeting spec for land release • Washdown bay sludge	Treat (offsite) and dispose	Where not connected to mains. Offsite disposal by licensed operator to the nearest licenced (council operated) Sewage Treatment Plant, where capacity exists, or either: • Townsville (for eastern portion from Hughenden) • Mount Isa (for western portion from Hughenden)
Non-treated construction wastewater (e.g., from • Concrete washout • (pile) Drilling fluids • Slurry from non-destructive drilling (contaminated) • Stormwater management • Dewatering excavations/other	Treat (offsite) and dispose	Sampling to confirm contamination level. Reuse if deemed clean in accordance with the Dewatering Management Plan. Partner with local vacuum truck companies. Dispose at Sewage Treatment Plant/landfill, subject to acceptance criteria. May require dewatering onsite/offsite for landfilling. Drying beds will be designed and used accordingly at an appropriate location with environmental controls.
• Paints, resins and solvents other hazardous waste • Paint tins and spray paint cans • Oily rags/air filters/hoses • Drums • Oil Filters • Used tyres and batteries • Condensate • Grease trap tanks • Plumbing works	Dispose offsite	Temporary segregated storage onsite at dedicated waste storage area at accommodation hubs and substations. Offsite disposal and waste tracking licensed sub-contractor to a licensed facility.
Used oils	Recover	Offsite licenced transport to the Northern Oil Refinery.

Waste Streams	Management Strategy	
	End use	Strategy
• Oily water/wash water • Refueling bay cleanouts	Treat (onsite) and dispose	Oily water separator at motor vehicle workshops. Offsite disposal by licensed operator to the nearest licenced (council operated) Sewage Treatment Plant, where capacity exists. Subject to design of the accommodation hub operated sewage treatment plants and ability to treat to a certain concentration of hydrocarbons.
Unexpected contamination (visual triggered)	Dispose	Engage a Suitably Qualified Person. Soil sampling in accordance with guidelines. Offsite disposal by licensed operator to a licensed facility based on acceptance criteria.
Hydrocarbon contaminated soils generated by project spills	Dispose	Offsite disposal by licensed operator to a licensed facility based on acceptance criteria.
Known contamination	Dispose	Management in accordance with the site-specific Contaminated Land Management Plan, developed by a Suitably Qualified Person, including sampling in accordance with guidelines. Disposal as a regulated waste (if on land not listed on the EMR/CLR). Disposal under a spoil disposal permit (if on land listed on the EMR/CLR), refer to the project's Regulatory Approvals Plan. Disposal at landfill.
• Ad blue tanks • Fuel tanks • DG containers • Water tanks	Reuse or recycle	Implement Waste Planning Protocol.
Grease	Recycle	Grease trap onsite storage. Partner with local landscaping supplies/other end user.

The initial waste assessment findings include:

- Facilities at Townsville and Mount Isa provide higher order waste hierarchal solutions and have been selected as the preferred locations for end uses
- A need to focus on material packaging during procurement in order to reduce timber and plastics generation due to limited solutions regionally
- Reliance on the operation of the Material Recovery Facility (MRF) at Mount Isa to divert/keep recyclable waste in the west as well as diverting recycled materials to the east in Townsville
- Strong awareness campaigns to celebrate behaviours to reduce wastewater generation, excessive waste off-cutting and plant and equipment maintenance
- Streamlined operation of ancillary activities will be required, particularly in relation to concrete batching and washdown bays
- Accommodation hub design elements and logistics planning will be critical to lawful waste management
- Stakeholder consultation, partnering agreements and adaptive management will be integral to achieving preferred end use outcomes during detailed design and construction (refer below).

Waste calculations have been based on:

- Similar recent transmission project experiences in project waste quantities and collection frequency, and lessons learnt regarding waste touchpoints in procurement and design
- Queensland publicly available waste data in relation to household waste generation per person
- Scale and intensity of the project including consideration of:
  - Accommodation hubs co-located with ancillary infrastructure.
  - Multiple work fronts and simultaneous operations.
  - Nominal schedule of a 2-year duration of any construction activity occurring over.

Waste end uses have been identified as part of the initial waste assessment in consultation with local waste service providers to map expected waste streams and the current end use strategies available. Council operated waste disposal locations have been identified along the alignment and listed in Appendix B however other than use of nominated regional sewage treatment facilities where capacity exists, no council landfills other than Mount Isa (servicing west of Hughenden) and Townsville and potentially Charters Towers (servicing east of Hughenden) locations are proposed to be utilised at this time in order to minimise direct impacts within small communities.

This has resulted in a waste strategy based on an east and west solution as follows.

- East Solution encompasses waste handling from Hughenden (including 330 and 500 KV substations) eastwards including Pentland, Charters Towers and Woodstock/Mulgrave
- West Solution encompassing waste handling west of Hughenden including Richmond, Julia Creek, Cloncurry, and Mount Isa.

4.1.1 Stakeholder consultation

This initial waste assessment has identified additional stakeholder consultation is required to develop specific higher end waste solutions:

- In the Western end of the project for:
  - Timber
  - Concrete
  - All plastics (including containers)
- On the premise the Mount Isa Material Recovery Facility (MRF) will be operational for paper and cardboard from project commencement
- In the Eastern end of the project for:
  - Timber
  - Paper
  - Plastic containers.

The following consultation is proposed to be undertaken to revise this WMP during detailed design prior to construction commencement.

- Engagement with Local Government Authorities on waste partnering opportunities including timber and concrete recycling at Mount Isa (under construction) MRF
- Engagement with key suppliers on sustainability opportunities for packaging (as committed to in the Sustainability Management Plan (0643-JV-PLN-SMP-0023)) in accordance with the Environmental Procurement Plan (refer to the below protocol)
- Engagement with Businesses and Landholders on local needs for the purpose of maximising local beneficial reuse.

4.1.2 Partnering arrangements

In order to facilitate preferred end use outcomes, partnering arrangements will be required to be developed for:

- Recycling steel materials, with steel recyclers
- Reusing organics, with landscape/other users including onsite options
- Suppliers using timber pallets underpinned by a return to sender using a back loading (truck) strategy
- Landholders, for beneficial use of excess concrete and timber, where expressions of interest have been identified.

4.1.3 Adaptive management

To verify proposed waste strategies are feasible as detailed design progresses and following construction commencement, it will be integral to continually monitor and evaluate actual waste quantities generated and what end uses are readily available or can be created, and to rapidly respond to these changing circumstances.

An ongoing planning approach (inclusive of stakeholder consultation) and monitoring program will support adaptive waste management onsite. Triggers for action will be imbedded in project performance reporting and will include:

- Excessive upward trending of wastes that is unplanned
- Greater than 10% change in actual waste quantities compared to predicted waste estimates for a specific construction phase
- New waste streams or waste type emerging
- New regional business recycling ventures
- Design option-engineering outcomes that form part of the Waste Planning Protocol.

4.2 Waste planning protocol

A Waste Planning Protocol will be implemented to achieve objectives of this WMP during detailed design (including all procurement and engineering) and early in construction phase (includes site establishment and work commencing on easement and at substations), which constitute environmental touchpoints where synergies can maximise environmental outcomes.

This protocol mandates the following requirements which is the responsibility of all project personnel to comply with, endorsed by the Project Director.

- Stakeholder consultation will be undertaken in accordance with Section 4.1.1 as early as possible to enter into agreements for preferred end waste solutions. To inform this consultation, the JV will investigate:
  - Opportunity for onsite composting of organic materials.
  - Bulk temporary waste storage or compaction equipment to reduce collection frequency whilst not resulting in adverse environmental impacts from odour, spills, littering, vermin, and visual amenity
  - The option for a live auction to be run during construction and at project completion to sell/gift reusable waste materials in preference to offsite transport (where loads are not logistically feasible or reuse under commercial agreements is not possible)
  - Known contaminated land based on listed properties to verify contamination potential through risk assessment processes and develop site specific control measures
- An Environmental Procurement Plan will be developed and implemented in order to:
  - Ensure the project's waste requirements and any targets are detailed in tender documents and relevant executed contracts
  - Short list suppliers with packaging initiatives
  - Preference suppliers and subcontractors during the procurement evaluation process offering waste solutions consistent with this WMP
  - Ensure quality of materials prior to site delivery and any packaging does not deteriorate during transport and storage resulting in waste
  - Concrete suppliers comply with the concrete EOWC for maximum beneficial use
- (Subject to consultation) Investigate the opportunity to enter a commercial arrangement with Mount Isa Council in order to augment the MRF capability to include timber and concrete recycling to avoid transference of this waste in the west to either landfill or long haulage solutions to eastern recycling solutions
- Develop a landholder agreement template for the beneficial reuse of waste to meet requirements of Section 104 of the WRRA for reusable waste materials by interested landholders. Prior to civil works on any particular property, a written agreement with the relevant third party / agent for any beneficial use of waste materials will be obtained
- Tender and enter into commercial agreements with local waste service providers that will support the project's waste solutions or improve the hierarchy of the proposed outcomes through established local knowledge and buying power
- Design temporary accommodation hubs with suitable bunded areas for waste storage (nominally 80 x 40m, with collection sump for pump outs) with turnaround access to cater for the predicted quantities of waste (without a high collection frequency) and level of segregation required

  It is noted that while hubs will be managed as the central storage area for the works area being serviced (i.e., max 90min travelling time away), transit storages will be created at working fronts or temporary works areas that will be internally shipped to central storages for recovery

- Design temporary accommodation hubs with a separable timber repurposing area (nominally 50 x 50m) with turnaround access to facilitate the conversion of timber into reusable products on site, including:
  - Dunnage used for support and protection of products from potential damage as they are stored in laydown areas or on easement/at substations
  - Outdoor seating
  - Raised garden beds associated with landscaping/shade screening
  - Other as deemed useful to construction or to meet a need of third-party users
- Design temporary accommodation hubs to optimise where possible:
  - A Sewage Treatment Plant (STP) with suitable effluent treatment train to maximise reuse of wastewater for beneficial use including:
    - Motor vehicle workshop cleaning
    - Washdown bay operations
    - Dual reticulation for toilets and laundry facilities, where mains connections are not available. Where available, additional potable water supply will be required at these locations
  - Automatic/closed system washdown bays that also treat (e.g., sand filter and sump with tank arrangement) and reuse water between washes
  - Stormwater drainage system that captures potentially contaminated water for treatment and diverts and captures clean stormwater for reuse in dust suppression activities
  - An oily water system at the Motor vehicle workshops to capture and treat wash water
- Design temporary and permanent infrastructure/disturbance areas to minimise:
  - Vegetation clearing
  - Excess spoil
  - Offsite supply of quarry material to avoid excesses during rehabilitation (when project won material could be used to rehabilitate borrow pit ground depressions when no longer required), unless designed to be retained *insitu* during operation and maintenance periods
- Operate temporary accommodation hubs with:
  - Provision of reusable lunch containers, coffee cups, lunch bags and water eskies for all workers to avoid single use plastics in accordance with the Plastics Plan
  - Mandated local buy and bulk buy requirements where feasible
- Prepare a Demobilisation Strategy as part of procurement stage to ensure all reusable formwork is the responsibility of the supplier/owner operator to demobilise and reuse
- The project's logistics plan will adopt a back loading strategy to ensure:
  - Waste is returned to the supplier where feasible (for overseas suppliers, the Environmental Procurement Plan will target alternative packaging options)
  - General waste is transported to end users were located on the return journey
  - Dedicated (non-regulated) waste storage onsite to achieve effective transportation. eg transporting with full loads
- The project's construction strategies will include:
  - Inspection and Test Plans that specify quality controls to ensure:
    - Concrete complies with the relevant specification during manufacturing processes, transport and seasonal constraints (e.g. high temperatures) to avoid excess concrete disposal and washouts
    - Materials storage and handling preservation specifications are complied with to avoid replacement buying
  - Design of temporary works areas that minimise footprints by innovative staging and plant solutions
  - Bills of Quantities and a Tower Bundles List that duly reflects the design and verified by quality assurance processes to inform procurement
  - Works supervision during delivery that minimises the percentage of waste in the installation of steel formwork, and when executing electrical and concrete scopes at towers and substations
- Environmental controls are installed *insitu* for:
  - Respreading of piling spoil on tower pads to avoid slurry waste disposal

  - The reuse of vegetative matter (for erosion and sediment control, habitat replacement and rehabilitation)
  - Vehicle cleanliness in respect of biosecurity matter
  - Waste type segregation to facilitate end uses, and any direct impacts from waste storage areas.
- The feasibility assessment to be used to determine waste disposal over waste recycling solutions must consider:
  - Environmental economics
  - Project and internal sustainability drivers and policy
  - Compliance with EIS commitments and conditions of approval
  - Stakeholder expectations and agreements
- Establish and continually run an education campaign to support good waste behaviour to:
  - Reduce water usage including timed showering and vehicle washes, particularly having regard to the El Nino watch and prevailing weather conditions
  - Reduce unplanned wastes including:
    - Sewage spills (Macerator failures/portaloo overflows)
    - Refuelling/other hazardous waste spills and spent spill kit materials
    - Excessive pavement materials during road works
  - Reduce food and packaging wastes
  - Maximise the use of products for plant and equipment maintenance (e.g., no overfilling, spray cans are exhausted etc..)
  - Avoid contamination
  - Avoid resource loss
  - Avoid littering.

4.3 On site storage and transportation

4.3.1 On site storage

All waste generated will be assessed and classified to ensure appropriate onsite storage for the selected waste strategy to be followed. Waste categorisation has been generally described in the initial waste assessment (Appendix A). Regulated waste will be identified as either category 1 or 2 dependent on risk and this will define the waste levy if disposed of at landfill.

All waste will be:

- Stored in:
  - Lidded bins for putrescible waste (nominally wheelie and skip bins), noting these may be located across the project area but waste for collection will be centralised at designated waste storage areas
  - A bunded area under cover or in integrity checked bins for regulated wastes
  - Dedicated cloth covered bins (nominally hook bins) for recyclable wastes with potential to be windblown (e.g., cardboard and plastics, if not using dedicated skip bins)
  - Designated hook bins/storage area for steel
  - Concrete washouts on easement, subject to permit to disturb process, for excess concrete management
  - Designated timber repurposing area for reusable timber
  - Stockpiled for loose non-organic materials (e.g., aggregates) with erosion and sediment controls in place
- Collected on a suitable frequency to prevent excess storage resulting in overtopping or storage outside designated areas from both accommodation hubs and substations (latter based on volume assessments)
- Transported in accordance with legal requirements for regulated waste and heavy vehicle national laws for all waste loads (dependent on the logistics planning for material and waste movement)

Waste management procedure for the correct transport of categorised waste is provided in **Appendix C.**

The storage and collection of segregated waste to ensure end use strategies are used, will be colour coded (for bins) and appropriately signed in consultation with our waste service provider supplying the waste containers.

The JV will have a team responsible for:

- Internal movement of bins and portaloos to areas of demand known as transit locations which may be on easement, at ancillary infrastructure locations or substations
- Assessment of volume of waste storage at any time to determine changes in collection frequency, or ad hoc collection requirements. For any change in collection frequencies the assessment will include whether additional containers are required to streamline the future collection program
- Collection and consolidation of wastes from transit locations to temporary waste storage areas at hubs or substations, dependent on waste collection arrangements with the preferred supplier and environmental controls in place
- Identification of any waste with no classification for environmental action
- Identification of contamination of waste type for management action
- Tracking waste documentation for regulated waste and managing docket/record databases. Refer to the waste monitoring program below.

4.4 Subcontractor management

The JV will tender and engage a waste service provider(s) to support compliance with this WMP.

The waste service provider(s) will:

- Be licenced for Regulated Waste Transport pursuant to the EP Act for regulated wastes, and preferentially offer an online tracking system for trackable wastes that can be relied upon during works to satisfy generator reporting. This means the waste transporter will be required to provide vehicles that satisfy the Code of Environmental Compliance for regulated waste transport and provide evidence of a current Environmental Authority during the procurement stage
- Utilise/create partnerships with local operators to achieve and where feasible, improve, waste end use strategies that are both compliant and cost effective, leaving a legacy in the region
- Provide integrity tested, colour coded and appropriately sized and signed waste containers to meet project demand and align with educational programs
- Provide a collection service to meet demand, including any changes to the program needed to avoid waste hazards or incidents
- Support with evidence/records, the waste monitoring program.

The JV will:

- Only utilise suitably qualified contractors to ensure compliance with legal requirements including retaining copies of all licences (available via Search for environmental authorities | Queensland Government (des.qld.gov.au))
- Randomly inspect offsite transport of wastes to ensure end use solutions are being met/maximised and there is no unlawful waste disposal. Refer to the assurance program below

All waste generated by subcontractors for the project, and not serviced by the JV waste service provider contract including use of site located bins, will also meet the requirements of this WMP, mandated through procurement and contract processes.

For all suppliers/subcontractors involved in the back loading strategy for the efficient transport of waste, monitoring and assurance programs of this WMP will also apply.

4.5 Waste assurance program

This WMP implementation will be supported by an assurance program comprising:

- Waste monitoring to confirm waste classifications where required
- Waste inspections, on a:
  - Daily basis, to verify:
    - No waste container overtopping/available volume

  - No overfilling, for transport purposes
  - Integrity of containers
  - No littering
  - Waste segregation
  - No pest presence or odour emissions
- Post rainfall at every dedicated waste storage area to verify bund capacity and pump out requirements
- Weekly basis, at every dedicated waste storage area, to verify:
  - Adequate waste storage and collection frequency
  - Waste storage area bunding integrity
  - Correct waste disposal
- Monthly basis, as part of waste reporting, to verify transport of regulated waste in accordance with third party licencing
- 6 monthly basis, to verify offsite end use locations are consistent with the waste strategy herein for random waste type and no unlawful disposal

- Wastewater release and reuse monitoring and inspections as per approval conditions.

All environmental monitoring (sampling and testing) of wastes will be undertaken in accordance with the JV's Environmental Monitoring Plan, refer to the project's EMF in Section 1. This will include:

- Verification monitoring for waste/hazardous classification, including oily water separator, refuelling bay, water treatment plant and washdown bay generated waste
- Stormwater quality
- Treated effluent disposal to land.

4.5.1 Corrective action

Waste issues on site will be managed in accordance with the JV's Environmental Incident and Non-Conformance Procedure. Refer to the project's EMF in Section 1.

4.6 Waste records program

Waste generated and its fate will be tracked per load through a docket system and reported monthly.

In addition, it is the responsibility of the Waste Transporter to complete Waste Tracking Certificates providing the prescribed information to the Regulator on the origin and fate of trackable (regulated) waste.

Accordingly, the JV will utilise the waste service providers and any haulage (delivery) company's recording system to capture the following information.

- Date transported
- Haulage contractor
- Waste type
- Waste classification (where trackable)
- Quantity (volume estimated and confirmed at end use location via either weigh bridges or other form of assessment, including agreed standard weights and conversion calculator)
- End use location
- Truck registration
- Docket numbers (haulage, receival, weighbridge, other)
- Waste tracking certificates (numbers only) for trackable wastes. Any paper-based certificate copies will be retained on site and issued externally as required under law

Details of the waste transport companies engaged by the project will be recorded in a Waste Transport Register, along with evidence of the transporter's licenses.

All suppliers/subcontractors will be required to report on a monthly basis waste generation and fate in accordance with the JV's HSEQ Subcontractor Requirements Handbook. To support the tracking of this waste

by suppliers and subcontractors who do not have established tracking record systems, dedicated waste tracking registers will be developed for their use. The JV proposes to use a document control system to automatically trigger this requirement for data from third parties coinciding with payment of invoices.

For project records not managed by a third party, the JV will keep a dedicated register. This is expected to apply to:

- Vegetation reuse
- Timber reuse
- Captured clean or treated stormwater reuse
- Wastewater reuse
- Wastewater disposal to land
- Beneficial reuse of waste under landholder or other commercial agreements.

The same standard for waste recording for suppliers/subcontractors will be adopted by the JV.

Based on waste records provided monthly by either waste service providers/delivery companies / suppliers / subcontractors and JV specific records, waste data will be consolidated in order to evaluate:

- The quantity of each type of waste sent to landfill
- The quantity of each type of waste reused
- The quantity of each type of waste recycled
- The quantity of each type of hazardous/regulated waste
- Trends in actual data against predicted volumes (using standard conversion calculations).

As a CIMIC Group requirement, waste yields will be recorded in Synergy as part of quarterly sustainability reporting.

4.6.1 Monthly environment report

All relevant information from waste records and evaluation, and assurance will be included in the Project Environmental Monthly Report. This report is prepared for internal performance reporting, Client reporting and available on request by third parties.

5. Management Controls

Waste management to ensure compliance and to reduce risk to the lowest acceptable rating achievable are planned before any relevant works commence. A summary of waste controls applicable, identified in this WMP are provided in Table 4.

Table 4 Waste management controls and mitigations

Waste Management Controls	
Environment Objectives	• To implement the waste hierarchy • Wastes to be disposed of in a lawful manner which does not harm the environment.
Performance Criteria	• Re-use and recycle waste whenever practical • Records of all waste movements to be maintained • Full compliance with Commonwealth and State legislation, guidelines and strategies • No contamination of land or water as a result of project waste management • No adverse impact on visual amenity or complaints regarding waste management.
Legislation	• Environmental Protection Act 1994 • Environmental Protection Regulation 2019 • Waste Reduction and Recycling Act 2011

Waste Management Controls	
	• Queensland Waste and Resource Recovery Strategy • Queensland Plastic Pollution Reduction Plan • Queensland Organics Strategy 2022-2032.
Approvals	Refer to the JV's Regulatory Approvals Plan
Monitoring	Refer to Section 4.5 of this WMP
Reporting	Refer to Section 4.6 of this WMP

Mitigation Measure	Responsibility
Sustainable procurement will be undertaken in accordance with a project **Environmental Procurement Plan**. Incorporate any waste procurement requirements of the Waste Planning Protocol in this Plan.	• The JV Procurement Manager • The JV Contracts Manager • Project Engineers
The **Waste Planning Protocol** to avoid/minimise planned waste generation in the design and delivery project stages will be implemented.	• The JV Design Manager • The JV Construction Manager
For identified specific activities that generate hazardous waste quantities activity specific plans will be developed including: • Concrete Batching • Sewage Treatment Plant • Water Treatment Plant • Motor Vehicle Workshop.	The Environmental Manger in partnership with Subcontractor
The waste service provider/end user will supply bins (with no integrity issues and all clearly labelled and colour-coded where agreed) in line with waste segregation requirements to achieve the end use outcomes of this WMP. Waste segregation will include, but not be limited to, depending on final stakeholder consultation, partnership agreements and adaptive management: • General waste • Organic wastes • Packaging (cardboard and plastics separate) • Steel • Concrete • Timber • Regulated wastes. A contract with the waste service provider(s)/agreements with third parties will also detail the collection frequency, based on waste predictions, and provide reliable records for reporting purposes.	The JV Contracts Manager UGLMS-131-387
Waste containers will be emptied from the worksite regularly to prevent vermin and pest infestations, overflows and to minimise odours emanating from such areas.	The JV Supervisor
Excess concrete and concrete washout will not to be discharged to land or stormwater. A concrete washout facility must always be used. Concrete washout facility locations will be pre-determined and managed as a hazardous storage and will be lined with stormwater controls and maintained to prevent overflow.	The JV Supervisor
Portaloos will be transported around the sites/work fronts without spillage and will be inspected daily to ensure adequate capacity for users. Once capacity is reached, maximum 80%, the portaloo will be changed out and emptied at the nearest project Sewage Treatment Plant. Bulky tanks will operate with high level alarms.	The JV Supervisor

Waste Management Controls	
Rubbish burning is not permitted. There are to be no fires. Smoking will be permitted at accommodation hubs in designated areas, but not at work locations.	The JV Supervisor

Appendix A Initial Waste Assessment

Initial Waste Assessment

Stage	Waste Category	Waste Stream	Source Activity	Solid/Liquid	Location	Current Estimate	Units	Current Estimate	Calc Assumptions	Waste Hierarchy	Storage	Onsite Treatment	End Use Location
Early Works	Regulated waste	Washdown bay sludge	Biosecurity hygiene	Solid	AVDATA Truckwashes/portable washdown bay	1,440	m3	=0.01*G5	Assume 10% solid content of washdown bay water	Dispose	Truckwash - NA, offsite facility	Portable - IBC/other container (if washdown bay onsite)	Truck wash set up with individual detention basins Sludge created by onsite washdowns captured in dewatering pillows and disposed of at landfill as regulated waste (weed contaminated)
Early Works	Non-regulated waste	Washdown bay water	Biosecurity hygiene	Liquid	AVDATA Truckwashes/portable washdown bay	144,000	L	=80*(60*30)	30L (calc on site) per minute, x 60 min daily x 8 work days across 8 shifts. Note AVDATA does not provide volume but timed minutes invoicing only	Avoid/Reduce	Truckwash - NA, offsite facility	Portable - treat via dewatering pillow	Release to ground
Early Works	Regulated waste	Septic	Staff Hygiene = 25 persons	Liquid	Alignment	1,350	L	=50*9*3	Full per shift - 9 shifts x 3 on site; 50L per person per shift	Dispose	Self-contained portaloo	NA	Sewage Treatment Facility - Supplier managed Council public dump points
Early Works	Non-regulated waste	Spoil (slurry)	Borehole drilling	Solid (some moisture)	Alignment	4,500	KG	=15*300	Per borehole (300) x 15kg excess	Dispose	IBC if required to be disposed offsite	Leave insitu, spread at borehole	Onsite treatment preferred Excess slurry disposed of at landfill (not preferred, unlikely)
Early Works	Non-regulated waste	Putrescible/general waste	25 persons	Solid	Alignment	540	KG	=1.5*15*24	1.5kg/p/week (15 av persons) - 24 weeks	Dispose	Accommodation facilities (temporary containers infield)	Waste containers in vehicles	Municipal arrangements as existing
Early Works	Non-regulated waste	Comingled recycling	25 persons	Solid	Alignment	180	KG	=0.5*15*24	0.5g/p/week (15 av persons) - 24 weeks	Recycle	Accommodation facilities (temporary containers infield)	Waste containers in vehicles	Municipal arrangements as existing
Early Works	Regulated waste	Hazardous contaminated materials (eg. Soil, spill kit materials, hoses) from diesel, coolant, grease, other	Drilling Operation of a vehicle	Solid	Alignment	Not estimated	NA	No formula	Not calculated as unplanned	Dispose	Secondary containment on vehicles	NA	Landfill
Set up	Non-regulated waste	Timber	Satellite Offices - construct and fit out	Solid	Alignment	100	pallets	No formula	10 satellite offices, 10 pallets per office	Reuse	Dedicated reuse area for repurposing	NA	Dunnage
Set up	Non-regulated waste	Comingled recycling - packaging	Satellite Offices - construct and fit out	Solid	Alignment	30	m3	No formula	10 satellite offices, 1 3m3 bin per fit out	Recycle	Plastics and Cardboard hook bins	NA	Mt Isa/Townsville recycling
Access	Non-regulated waste	Property timber fence posts	Intersect with fences, replace with gates	Solid	Alignment	Not estimated	Posts	No formula	Unknown quantity	Reuse	Waste storage area	NA	Landholder beneficial reuse (alternative: timber recycling)
Access	Non-regulated waste	Property fence wiring	Intersect with fences, replace with gates	Solid	Alignment	Not estimated	m	No formula	Unknown quantity	Reuse	Waste storage area	NA	Landholder beneficial reuse (alternative: steel recycling)
Access	Non-regulated waste	Clean spoil (wet/dry)	WWBW box out	Solid(some moisture potential)	Alignment	1,350	m3	=450*3	450 crossings - average 3m3 per crossing	Reuse	Stockpiled	ESC	Rehabilitation
Access/clearing	Regulated waste	Empty aerosol cans	Surveying Motor Vehicle Workshop	Solid	Alignment and substations	1,000	cans	=100*10	100 per 100km	Recycle	Waste storage area	NA	Mt Isa/Townsville recycling
Access/ESC	Non-regulated waste	IBCs used (from stonewall)	CESCP activities	Solid	Alignment and substations	200	IBCs	No formula	Assume 1 IBC per 5km/substation + reapplication	Reuse	Waste storage area	Washout	Return to Supplier/Dedicated Recycling Facility
Access/ESC	Non-regulated waste	Timber pegs	CESCP activities	Solid	Alignment and substations	3,000	Pegs	No formula	Combination of 600-900mm stakes, delivered on a pallet with 20 bundles of 25 per pallet	Dispose	Timber repurposing area	Reuse on site where possible	Landfill Return to Supplier if possible Auction/Beneficial reuse
Access/ESC	Non-regulated waste	Sediment fencing/Geofabric	CESCP activities	Solid	Alignment and substations	120	km	No formula	1km per 10km on easement 200m per substation x 6 1km per camp	Dispose	Waste storage area	NA	Landfill
Access/ESC	Non-regulated waste	Coir Logs	CESCP activities	Solid	Alignment and substations	Not estimated	NA	No formula	Not estimated, retained insitu	Leave insitu			
Camp construction	Non-regulated waste	Putrescible/general waste	Construction crew occupation	Solid	Accommodation Hubs	6,750	KG	=30*2.5*90	No commerical kitchen - 2.5kg/p/day (50% of general waste estimate based on 1/3 recyclable) - crew of 30 (5 per site), 3 months construction	Dispose	Waste storage area	NA	Landfill
Camp construction	Non-regulated waste	Timber	Manufactured offsite dongas, installation and fit out	Solid	Accommodation Hubs	480	pallets	=20*4*6	20 pallets per week fitout - 1 month	Reuse	Waste storage area	NA	Return to Supplier
Camp construction	Non-regulated waste	Cardboard	Manufactured offsite dongas, installation and fit out	Solid	Accommodation Hubs	1,440	m3	=20*4*3*6	2 x 10m3 hook bins , weekly collection - 3 months construction per camp	Recycle	Waste storage area	NA	Bailed. End use as per waste service provider recycling contract.
Camp construction	Non-regulated waste	Steel	Manufactured offsite dongas, installation and fit out	Solid	Accommodation Hubs	180	m3	=10*3*6	1 x 10m3 hook bin monthly x 3 month construction per camp	Recycle	Waste storage area	NA	Steel recycling facility - Townsville Steel recycling facility - Mt Isa
Camp construction	Non-regulated waste	Plastics and strapping/co mingled recycling	Manufactured offsite dongas, installation and fit out	Solid	Accommodation Hubs	240	m3	=10*4*6	1 x 10m3 hook bins , weekly collection - 3 months construction per camp	Recycle	Waste storage area	NA	Townsville recycling facility
Camp construction	Non-regulated waste	Concrete	Manufactured offsite dongas, installation and fit out	Solid	Accommodation Hubs			No formula	Unplanned quantities, managed as general waste	Dispose	Waste storage area	Reuse in road base on internal roads?	Landfill
Camp construction	Regulated waste	Septic	Mobile bulk facility	Liquid	Accommodation Hubs	2,016,000	L	=10*300*(16*7)*6	Crew - 10 per site (6 sites) x 16 weeks, assume 300/L/day	Dispose	Bulky tanks	NA	Sewage Treatment Plant
Camp construction	Regulated waste	Clinical waste	Construction crew hygiene	Solid	Accommodation Hubs	1,200	L	=50*4*6	1 x 50L bin per location per month	Dispose	Self-contained bins	NA	Landfill
Camp construction	Non-regulated waste	Slurry	Potholing for services	Liquid	Accommodation Hubs	210,000	L	=5000*7*6	7 days per camp, 1 load per day, 5000L tanker, uincontaminated sites	Dispose	Dewatering offsite	NA	Landfill
All offices - occupied	Non-regulated waste	Paper and cardboard	Office waste	Solid	Accommodation Hubs	133,120	KG	=1.6*52*400*4	1.6kg/p/week based on average workforce of 400 FTE over the duration of the project (4 years)	Reuse	Cardboard skip bin Paper skip bin	Compost	Bailed End use as per waste service provider recycling contract Townsville location. May use Mt Isa MRF when available
All offices - occupied	Non-regulated waste	Electronics	Office waste	Solid	Accommodation Hubs	960	KG	=0.3*1600*2	0.3kg/p/year, 1600 pax, 2 years	Recycle	Ark Planet Recycling Box	NA	Townsville recycling facility
All offices - occupied	Regulated waste	Batteries	Office waste	Solid	Accommodation Hubs	240	Batteries	No formula	10 batters per week, 24 months	Recycle	Planet Ark Battery Recycling Bins	NA	To be determined
Camp operation - Cloncurry - 230 pax	Non-regulated waste	Putrescible/general waste	Kitchen/accommodation occupation	Solid	Accommodation Hubs	575,000	KG	=230*5*500	Average aus 1.5T/year (greenpeace) vs 514kg/pp/yr (Qld Gov 2020 SOE report vs 540kg/pp/year Qld Gov 2017/18 SOE report). Average 5kg/p/day, (based on 10/4 roster, assume 250 days) Assume peak for 2 years	Dispose	Waste storage area	assume 50% organic waste recycled, if organic initiative progressed	Landfill
Camp operation - Cloncurry - 230 pax	Non-regulated waste	Comingled recycling	Kitchen/accommodation occupation	Solid	Accommodation Hubs	287,500	KG	=2.5*230*500	2.5kg/p/day (50% of general waste estimate based on 1/3 recyclable)	Recycle	Waste storage area	NA	Recycling - Mt Isa facility (dependent on MRF start date) Recycling - Townsville facility
Camp operation - Cloncurry - 230 pax	Non-regulated waste	Cardboard	Kitchen/accommodation occupation	Solid	Accommodation Hubs	1,248	m3	=12*104	2 x 3m3 skips emptied twice weekly	Recycle	Waste storage area	May be partially used for any composting facility onsite	Bailed End use as per waste service provider recycling contract

Initial Waste Assessment

Stage	Waste Category	Waste Stream	Source Activity	Solid/Liquid	Location	Current Estimate	Units	Current Estimate	Calc Assumptions	Waste Hierarchy	Storage	Onsite Treatment	End Use Location
Camp operation - Cloncurry - 230 pax	Non-regulated waste	Timber Pallets	Kitchen/accommodation occupation	Solid	Accommodation Hubs	1,040	pallets	=10*104	delivery twice week - 10 pallets	Dispose	Timber repurposing area	Reuse on site where possible	Landfill Return to Supplier if possible Auction/Beneficial reuse
Camp operation - Julia Creek - 210 pax	Non-regulated waste	Putrescible/general waste	Kitchen/accommodation occupation	Solid	Accommodation Hubs	525,000	KG	=210*5*500	Average aus 1.5T/year (greenpeace) vs 514kg/pp/yr (Qld Gov 2020 SOE report vs 540kg/pp/year). Average 5kg/p/day, (based on 10/4 roster, assume 250 days) Assume peak for 2 years	Dispose	Waste storage area	assume 50% organic waste recycled, if organic initiative progressed	Landfill
Camp operation - Julia Creek - 210 pax	Non-regulated waste	Comingled recycling	Kitchen/accommodation occupation	Solid	Accommodation Hubs	262,500	KG	=2.5*210*500	2.5kg/p/day (50% of general waste estimate based on 1/3 recyclable)	Recycle	Waste storage area	NA	Recycling - Mt Isa facility (dependent on MRF start date). Recycling - Townsville facility.
Camp operation - Julia Creek - 210 pax	Non-regulated waste	Cardboard	Kitchen/accommodation occupation	Solid	Accommodation Hubs	1,248	m3	=12*104	2 x 3m3 skips emptied twice weekly	Recycle	Waste storage area	May be partially used for any composting facility onsite	Bailed End use as per waste service provider recycling contract
Camp operation - Julia Creek - 210 pax	Non-regulated waste	Timber Pallets	Kitchen/accommodation occupation	Solid	Accommodation Hubs	1,040	pallets	=10*104	delivery twice week - 10 pallets	Dispose	Timber repurposing area	Reuse on site where possible	Landfill Return to Supplier if possible Auction/Beneficial reuse
Camp operation - Richmond - 210 pax	Non-regulated waste	Putrescible/general waste	Kitchen/accommodation occupation	Solid	Accommodation Hubs	525,000	KG	=210*5*500	Average aus 1.5T/year (greenpeace) vs 514kg/pp/yr (Qld Gov 2020 SOE report vs 540kg/pp/year). Average 5kg/p/day, (based on 10/4 roster, assume 250 days) Assume peak for 2 years	Dispose	Waste storage area	assume 50% organic waste recycled, if organic initiative progressed	Landfill
Camp operation - Richmond - 210 pax	Non-regulated waste	Comingled recycling	Kitchen/accommodation occupation	Solid	Accommodation Hubs	262,500	KG	=2.5*210*500	2.5kg/p/day (50% of general waste estimate based on 1/3 recyclable)	Recycle	Waste storage area	NA	Recycling - Mt Isa facility (dependent on MRF start date). Recycling - Townsville facility.
Camp operation - Richmond - 210 pax	Non-regulated waste	Cardboard	Kitchen/accommodation occupation	Solid	Accommodation Hubs	1,248	m3	=12*104	2 x 3m3 skips emptied twice weekly	Recycle	Waste storage area	May be partially used for any composting facility onsite	Bailed End use as per waste service provider recycling contract
Camp operation - Richmond - 210 pax	Non-regulated waste	Timber Pallets	Kitchen/accommodation occupation	Solid	Accommodation Hubs	1,040	pallets	=10*104	delivery twice week - 10 pallets	Dispose	Timber repurposing area	Reuse on site where possible	Landfill Return to Supplier if possible Auction/Beneficial reuse
Camp operation - Hughenden - 410 pax	Non-regulated waste	Putrescible/general waste	Kitchen/accommodation occupation	Solid	Accommodation Hubs	1,025,000	KG	=410*5*500	Average aus 1.5T/year (greenpeace) vs 514kg/pp/yr (Qld Gov 2020 SOE report vs 540kg/pp/year). Average 5kg/p/day, (based on 10/4 roster, assume 250 days) Assume peak for 2 years	Dispose	Waste storage area	assume 50% organic waste recycled, if organic initiative progressed	Landfill
Camp operation - Hughenden - 410 pax	Non-regulated waste	Comingled recycling	Kitchen/accommodation occupation	Solid	Accommodation Hubs	512,500	KG	=2.5*410*500	2.5kg/p/day (50% of general waste estimate based on 1/3 recyclable)	Recycle	Waste storage area	NA	Recycling - Townsville facility.
Camp operation - Hughenden - 410 pax	Non-regulated waste	Cardboard	Kitchen/accommodation occupation	Solid	Accommodation Hubs	2,496	m3	=24*104	4 x 3m3 skips emptied twice weekly	Recycle	Waste storage area	May be partially used for any composting facility onsite	Bailed End use as per waste service provider recycling contract
Camp operation - Hughenden - 410 pax	Non-regulated waste	Timber Pallets	Kitchen/accommodation occupation	Solid	Accommodation Hubs	2,080	pallets	=20*104	delivery twice week - 20 pallets	Dispose	Timber repurposing area	Reuse on site where possible	Landfill Return to Supplier if possible Auction/Beneficial reuse
Camp operation - Pentland - 300 pax	Non-regulated waste	Putrescible/general waste	Kitchen/accommodation occupation	Solid	Accommodation Hubs	750,000	KG	=300*5*500	Average aus 1.5T/year (greenpeace) vs 514kg/pp/yr (Qld Gov 2020 SOE report vs 540kg/pp/year). Average 5kg/p/day, (based on 10/4 roster, assume 250 days) Assume peak for 2 years	Dispose	Waste storage area	assume 50% organic waste recycled, if organic initiative progressed	Landfill
Camp operation - Pentland - 300 pax	Non-regulated waste	Comingled recycling	Kitchen/accommodation occupation	Solid	Accommodation Hubs	375,000	KG	=2.5*300*500	2.5kg/p/day (50% of general waste estimate based on 1/3 recyclable)	Recycle	Waste storage area	NA	Recycling - Townsville facility.
Camp operation - Pentland - 300 pax	Non-regulated waste	Cardboard	Kitchen/accommodation occupation	Solid	Accommodation Hubs	1,872	m3	=18*104	3 x 3m3 skips emptied twice weekly	Recycle	Waste storage area	May be partially used for any composting facility onsite	Bailed End use as per waste service provider recycling contract
Camp operation - Pentland - 300 pax	Non-regulated waste	Timber Pallets	Kitchen/accommodation occupation	Solid	Accommodation Hubs	1,560	pallets	=15*104	Delivery twice week - 15 pallets	Dispose	Timber repurposing area	Reuse on site where possible	Landfill Return to Supplier if possible Auction/Beneficial reuse
Camp operation - Charters Towers - 210 pax	Non-regulated waste	Putrescible/general waste	Kitchen/accommodation occupation	Solid	Accommodation Hubs	525,000	KG	=210*5*500	Average aus 1.5T/year (greenpeace) vs 514kg/pp/yr (Qld Gov 2020 SOE report vs 540kg/pp/year). Average 5kg/p/day, (based on 10/4 roster, assume 250 days) Assume peak for 2 years	Dispose	Waste storage area	assume 50% organic waste recycled, if organic initiative progressed	Landfill
Camp operation - Charters Towers - 210 pax	Non-regulated waste	Comingled recycling	Kitchen/accommodation occupation	Solid	Accommodation Hubs	262,500	KG	=2.5*210*500	2.5kg/p/day (50% of general waste estimate based on 1/3 recyclable)	Recycle	Waste storage area	NA	Recycling - Townsville facility.
Camp operation - Charters Towers - 210 pax	Non-regulated waste	Cardboard	Kitchen/accommodation occupation	Solid	Accommodation Hubs	1,248	m3	=12*104	2 x 3m3 skips emptied twice weekly	Recycle	Waste storage area	May be partially used for any composting facility onsite	Bailed End use as per waste service provider recycling contract
Camp operation - Charters Towers - 210 pax	Non-regulated waste	Timber Pallets	Kitchen/accommodation occupation	Solid	Accommodation Hubs	1,040	pallets	=10*104	delivery twice week - 10 pallets	Dispose	Timber repurposing area	Reuse on site where possible	Landfill Return to Supplier if possible Auction/Beneficial reuse
Camp operation	Regulated waste	Grease	Kitchen/cooking - greast trap	Liquid	Accommodation Hubs	93,600	KG	=150*6*104	Assume 150kg grease trap per camp per week	Recycle	Grease trap containment	May be partially used to add liquid to any organic composting facility onsite	Composting
Sewage treatment plant - operation	Regulated waste	Biosolids sludge	Sewage Treatment Plant	Liquid	Accommodation Hubs	24,960	m3	=40*104*6	40m3 per week, collection monthly	Dispose	Containment	NA	Sewage Treatment Plant
Sewage treatment plant - operation	Regulated waste	Non-spec sewage	Ad hoc pump outs	Liquid	Accommodation Hubs	Not estimated		No formula	Not estimated, unplanned	Dispose	Containment	NA	Sewage Treatment Plant
Sewage treatment plant - operation	Regulated waste	Chemical containers	Sewage Treatment Plant	Solid	Accommodation Hubs	600	Plastic containers	No formula	100 x 20L containers per camp	Recycle	Waste storage area	Washed out, at motor vehicle workshop	To be determined
Water treatment operation	Regulated waste	Clarified Solids	Water Treatment Plant	Solid	Accommodation Hubs	144	m3	=24*6	1m3 per month, assume 24 months	Dispose	Containment	NA	Sewage Treatment Plant
Water treatment operation	Regulated waste	Chemical containers - 1000L IBCs	Chemical storage	Solid	Accommodation Hubs	144	IBCs	=24*6	1 IBC per month x 24 months	Reuse	Waste storage area	Washout	Return to Supplier/Dedicated Recycling Facility
Washdown bay - operation	Regulated waste	Contaminated soil (solids/sand filter)	Washdown bay	Solid	Washdown bays x 16	4,608	m3	=12*16*24	Washout monthly, 1m3 sumps, 6 camps + 10 alignment, water filtered and recycled in tanks/onsite detention basin (24 months average operation), slight moisture content	Dispose	Washdown facilities built in (tanks/detention basin)	Water recycled, topped up as required	Landfill

Initial Waste Assessment

Stage	Waste Category	Waste Stream	Source Activity	Solid/Liquid	Location	Current Estimate	Units	Current Estimate	Calc Assumptions	Waste Hierarchy	Storage	Onsite Treatment	End Use Location
Civil works	Non-regulated waste	Vegetation/timber	Clearing	Solid	Easement	Not estimated	NA	No formula	Not estimated, retained onsite	Reuse	Spread	Mulched	ESC, gorundcover, rehabilitation
Civil works	Non-regulated waste	Vegetation/timber	Clearing	Solid	Substation	Not estimated	NA	No formula	Not estimated, retained onsite	Reuse	Stockpiled/Mulched	NA	Stockpiled for rehabilitation
Civil works	Regulated waste	Contaminated Soil (as per EMR proven sites)	Temporary disturbance	Solid	Alignment	Not estimated	NA	No formula	Subject to soil analysis and bulk earthworks design	Dispose	Stockpiled	Geofabric covered	Landfill
Civil works	Regulated waste	Weeds	Clearing	Solid	Weed survey sites	Not estimated	NA	No formula	Not estimated, retained onsite	Dispose	Stockpiled	Segrated Buried	Disposed of onsite
Civil works	Non-regulated waste	Topsoil	Temporary disturbance	Solid	Alignment	Not estimated	NA	No formula	Not estimated, assume balanced onsite	Leave insitu			
Civil works	Non-regulated waste	Subsoil	Temporary disturbance	Solid	Alignment	Not estimated	NA	No formula	Not estimated, assume balanced onsite	Leave insitu			
Road works	Non-regulated waste	Bitumen	Road upgrade construction	Solid	Public Roads	Not estimated	NA	No formula	Not estimated, asssume no excess	Leave insitu			
Road works	Non-regulated waste	Linemarking paint residue	Road upgrade construction	Liquid	Public Roads	Not estimated	NA	No formula	Not estimated, asssume no excess	Leave insitu			
Motor Vehicle Workshops	Non-regulated waste	Adblue tanks	Vehicle operation	Solid	Accommodation Hubs	624	IBCs	=104*6	2 IBCs per camp per week	Reuse	Waste storage area	Washout	Return to Supplier/Dedicated Recycling Facility
Motor Vehicle Workshops	Regulated waste	Oily water	Vehicle operation	Liquid	Accommodation Hubs	6,240,000	L	=10000*104*6	10000L per week	Dispose	Containment sump	Oily water separator	Sewage treatment plant
Motor Vehicle Workshops	Regulated waste	Used oils	Vehicle operation	Liquid	Accommodation Hubs	144,000	L	=1000*24*6	1000L per month	Recycle	Containment sump	Oily water separator	Northern Oil Refinery
Motor Vehicle Workshops	Regulated waste	(oily/greasy) Rags	Vehicle operation	Solid	Accommodation Hubs	174,720	L	=280*104*6	280L wheelie bin per week	Dispose	Waste storage area	NA	Landfill
Motor Vehicle Workshops	Regulated waste	Drums	Vehicle operation	Solid	Accommodation Hubs	624	Drums	=6*104	6 drums per week	Dispose	Waste storage area	NA	Landfill
Motor Vehicle Workshops	Regulated waste	hydraulic hoses	Vehicle operation	Solid	Accommodation Hubs	216	m3	=1.5*24*6	1.5m skip every month per camp	Dispose	Waste storage area	NA	Landfill
Motor Vehicle Workshops	Regulated waste	Oil filters	Vehicle operation	Solid	Accommodation Hubs	216	m3	=1.5*24*6	1.5m skip every month per camp	Dispose	Waste storage area	NA	Landfill
Motor Vehicle Workshops	Regulated waste	Tyres	Vehicle operation	Solid	Accommodation Hubs	6,240	Tyres	=10*104*6	10 tyres per week per hub	Recycle	Waste storage area	NA	To be determined
Motor Vehicle Workshops	Regulated waste	Batteries	Vehicle operation	Solid	Accommodation Hubs	1,040	Batteries	=10*104	10 batters per week	Recycle	Waste storage area	NA	To be determined
Concrete Batching Plant	Non-regulated waste	Washwater	Concrete batching	Liquid	Accommodation Hubs	312,000	L	=1000*6*52	10000L per week	Recycle	Stormwater management	Detention Basin	Sewage Treatment Plant
Concrete Batching Plant	Non-regulated waste	Aggregates	Concrete products	Solid	Accommodation Hubs	Not estimated	NA	No formula	Not estimated, assume no excess	Leave insitu			
Fuel Storage	Regulated waste	Hydrocarbon impacted soils	Spills		Accommodation Hubs	Not estimated	NA	No formula	Not estimated, unplanned	Dispose	Waste storage area	NA	Landfill
Fuel Storage	Regulated waste	Spent spill kit materials	Spills		Accommodation Hubs	Not estimated	NA	No formula	Not estimated, unplanned	Dispose	Waste storage area	NA	Landfill
Fuel Storage	Regulated waste	Spills/hydrocarbon contaminated stormwater	Chemical storage	Liquid	Accommodation Hubs	192,000	L	=24000*8	1 pump out monthly, assume 24000L over wet season of 4 months for 2 years	Dispose	Containment	NA	Landfill
Foundations	Non-regulated waste	Excess concrete	Washout of agi-shutes after concrete pouring	Solid	Tower pads	1,600	m3	=1*1600	1 pit = 1m3 per tower (tower pads = 1600)	Recycle	Concrete washout facilities	Evaporation	Landfill Beneficial reuse to be investigated
Foundations	Non-regulated waste	Timber pallets	From spacer wheels used on foundation reo cage installation	Solid	Tower pads	1,600	pallets	No formula	1 pallet per tower (tower pads = 1600)	Dispose	Timber repurposing area	Timber reuse	Landfill Return to Supplier if possible Auction/Beneficial reuse
Foundations	Non-regulated waste	Plastic	Spacer wheels used on foundation reo cage installation	Solid	Tower pads	3,200	KG	=1600*2	Plasic per timber pallet, 2kg/timber pallet	Dispose	Waste storage area	NA	To be determined
Foundations	Non-regulated waste	Steel	Offcuts from reo-steel cages	Solid	Tower pads	1,600	m3	No formula	includes reo straight bars and rings, tire wire, assume 1m3 per tower	Recycle	Waste storage area	NA	Townsville/Mt Isa steel recycling
Assembly and erection	Non-regulated waste	Hard Plastic	Supply of bolts, washers, nuts and packers	Solid	Tower pads	3,200	Pallets	=1600*2	2 pallets per tower	Recycle	Waste storage area	NA	To be determined
Assembly and erection	Non-regulated waste	Hessian bags	Supply of bolts, washers, nuts and packers	Solid	Tower pads	125,000	bags	=12500*10	12500 bags per 160 towers at Macintyre, 1600 CUS towers	Reuse	Storage area	NA	Rehabilitation
Assembly and erection	Non-regulated waste	Plastic bags	Supply of bolts, washers, nuts and packers	Solid	Tower pads	125,000	bags	=12500*10	12500 bags per 160 towers at Macintyre, 1600 CUS towers	Dispose	Waste storage area	NA	Landfill Plastic recycling options to be investigated
Assembly and erection	Non-regulated waste	Steel strapping	Tower steel bundling	Solid	Tower pads	240,000	m	=5*30*1600	5m per steel bundle, 30 bundels per tower	Recycle	Waste storage area	NA	Townsville/Mt Isa steel recycling
Assembly and erection	Non-regulated waste	Steel	Non-spec steel (offcuts)	Solid	Tower pads	1,600	m3	No formula	1m3 per tower	Recycle	Waste storage area	NA	Townsville/Mt Isa steel recycling
Assembly and erection	Non-regulated waste	Timber	Wooden dunnage - from supplier for delivery	Solid	Laydown	Not estimated	NA	No formula	Subject to detailed procurement strategy	Reuse	Timber repurposing area	Timber reuse	Landfill Return to Supplier if possible Auction/Beneficial reuse
Assembly and erection	Non-regulated waste	Timber	Wooden dunnage - during works	Solid	Tower pads	80,000	blocks	=50*1600	80 (100x100x300mm) wooden blocks per tower due to some being reused per tower, reduce to 50 based on 8000 used at Macintyre per 160 towers	Reuse	Timber repurposing area	Timber reuse	Recycled and moved with towers within biosecurity zones End use to be determined for excess timber
Assembly and erection	Non-regulated waste	Paint cans	Steel surfacing	Solid	Tower pads	1,600	Cans	No formula	1 per tower - need to convert to tonnage	Recycle	Waste storage area	NA	To be determined
Assembly and erection	Non-regulated waste	Spray paint cans	Steel surfacing	Solid	Tower pads	1,600	cans	No formula	1 per tower - need to convert to tonnage	Recycle	Waste storage area	NA	To be determined
Stringing	Non-regulated waste	Timber	Client supplied - palleted and boxed insulators	Solid	Tower pads	444	Pallets	=400*100/90	90 insulators per pallet, used 4000 at Macintyre	Dispose	Timber repurposing area	Timber reuse	Landfill Return to Supplier if possible Auction/Beneficial reuse
Stringing	Non-regulated waste	Cardboard	Client supplied - palleted and boxed insulators	Solid	Tower pads	22,222	KG	=(4000*100/90)*5	90 insulators per pallet, used 4000 at Macintyre, 5kg cardbard per pallet	Recycle	Waste storage area	NA	Townsville
Stringing	Non-regulated waste	Steel	Empty condutor drums	Solid	Tower pads	38,000	conductor drums	=380*100	approx 380 at Macintyre - refer to BOQ	Recycle	Waste storage area	NA	Townsville/Mt Isa steel recycling
Stringing	Non-regulated waste	Cardboard	Packaging of conductor drums	Solid	Tower pads	190,000	KG	=380*100*5	approx 380 drums at Macintyre - refer to BOQ, 5kg per drum	Recycle	Waste storage area		Bailed End use as per waste service provider recycling contract
Stringing	Non-regulated waste	Coreflute	Packaging of conductor drums	Solid	Tower pads	76,000	KG	=380*100*2	approx 380 at Macintyre - refer to BOQ, 2kg per drum	Recycle	Waste storage area		End use as per waste service provider recycling content
Stringing	Non-regulated waste	Timber	Packaging of conductor drums - wooden outer protection layer	Solid	Tower pads	2,280,000	KG	=380*100*60	approx 380 at Macintyre - refer to BOQ, 60kg per drum	Dispose	Timber repurposing area	Timber reuse	Landfill Return to Supplier if possible Auction/Beneficial reuse
Stringing	Non-regulated waste	Steel	OPGW fibre empty steel drums	Solid	Tower pads	4,500	steel drums	=45*100	approx 45 at Macintyre - refer to BOQ	Recycle	Waste storage area	NA	Townsville/Mt Isa steel recycling
Stringing	Non-regulated waste	Cardboard	Packaging of OPGW fibre steel drums	Solid	Tower pads	13,500	KG	=45*100*3	approx 45 at Macintyre - refer to BOQ. 3kg per drum	Recycle	Waste storage area		Bailed End use as per waste service provider recycling contract
Stringing	Non-regulated waste	Coreflute	Packaging of OPGW fibre steel drums	Solid	Tower pads	4,500	KG	=45*100*1	approx 45 at Macintyre - refer to BOQ, 1 kg/drum	Recycle	Waste storage area		End use as per waste service provider recycling content
Stringing	Non-regulated waste	Timber	Packaging of OPGW fibre steel drums	Solid	Tower pads	135,000	KG	=45*100*30	approx 45 at Macintyre - refer to BOQ, 30kg per drum	Dispose	Timber repurposing area	Timber reuse	Landfill Return to Supplier if possible Auction/Beneficial reuse
Rehabiltation	Non-regulated waste	Survey pegs	Surveying	Solid	Alignment	47,300	pegs	=(13*2100)+(20*1000)	13 pegs per tower outline/legs/centre and offset, + 20 pegs per km easement demarcation - need to convert to tonnage	Dispose	Timber repurposing area	Timber reuse	Landfill Return to Supplier if possible Auction/Beneficial reuse
Rehabiltation	Non-regulated waste	Orange HDPE (plastic conduit)	Surveying	Solid	Alignment in high density vegetation	4,000	2m pipes	=20*200	assumed 20% of the easement length - need to convert to tonnage	Recycle	Temporary	NA	
Rehabilitation	Non-regulated waste	Access track - gravel	Rehabilitation - gravel	Solid	Temporary construction access track - 3m wide	NA	NA	No formula	Retained onsite / permanent tracks - 3m in width only	Leave insitu			Note: Retained for operations (reduced scope) unless directed otherwise by Client
Rehabilitation	Non-regulated waste	Access track - gravel	Rehabilitation - gravel	Solid	Temporary construction access track - 1.5m wide pass bays	9,000	m3	=(0.15*40*1.5)*1000	1.5m passbay 40m in width every 1km, 150mm depth gravel	Dispose	NA	NA	To be determined Investigate options for leave insitu
Rehabilitation	Non-regulated waste	Access track - gravel/bituem	Rehabilitation - turnins/outs and B-double decoupling bays	Solid	Road reserve and intersecting tracks	245,520	m3	=1636800*0.15	Refer to disturbance data (alignment)	Dispose	NA	NA	To be determined Investigate options for leave insitu (note design constraint)

Initial Waste Assessment

Stage	Waste Category	Waste Stream	Source Activity	Solid/Liquid	Location	Current Estimate	Units	Current Estimate	Calc Assumptions	Waste Hierarchy	Storage	Onsite Treatment	End Use Location
Rehabilitation	Non-regulated waste	Road upgrades - Camps	Rehabilitation - bitumen	Solid	Road upgrades at all camps	147,900	m3	=986000*0.15	Refer to disturbance data, pavement depth 150mm	Dispose	NA	NA	To be determined Investigate options for leave insitu Auction/Beneficial reuse
Rehabiltation	Non-regulated waste	Rock	Waterway crossing demob from temp construction track	Solid	Alignment - waterway/watercourse crossings	NA	NA	No formula	Not estimated, retained insitu for maintenance	Leave insitu	NA	NA	Retain for operations, to be confirmed
Rehabiltation	Non-regulated waste	Geofabric	Waterway crossing demob from temp construction track	Solid	Alignment - waterway/watercourse crossings	NA	NA	No formula	Not estimated, retained insitu for maintenance	Leave insitu	NA	NA	Retain for operations, to be confirmed
Rehabiltation	Non-regulated waste	DMAX pipe	Waterway crossing demob from temp construction track	Solid	Alignment - waterway/watercourse crossings	NA	NA	No formula	Not estimated, retained insitu for maintenance	Leave insitu	NA	NA	Retain for operations, to be confirmed
Rehabiltation	Non-regulated waste	Soil	Railway crossing	Solid	Railway crossings	NA	NA	No formula	Assume 50 crossings, subject to detailed design	Leave insitu	NA	NA	Retain for operations, to be confirmed
Rehabiltation	Non-regulated waste	Pipe	Railway crossing	Solid	Railway crossings	NA	NA	No formula	Assume 50 crossings, subject to detailed design	Leave insitu	NA	NA	Retain for operations, to be confirmed
Rehabiltation	Non-regulated waste	Gravel	Railway crossing	Solid	Railway crossings	NA	NA	No formula	Assume 50 crossings, subject to detailed design	Leave insitu	NA	NA	Retain for operations, to be confirmed
Demobilisation	Non-regulated waste	Furniture	Camps	Solid	Accommodation Hubs	75,000	KG	=1500*50	50kg per room, nominal 1500	Recycle	NA	NA	Auction/Beneficial Reuse
Demobilisation	Non-regulated waste	Mattresses	Dongas	Solid	Accommodation Hubs	1,600	mattresses	No formula	Single mattresses, aligns with camp occupation with 10% replacement.	Dispose	NA	NA	Landfill
Demobilisation	Non-regulated waste	Linen	Dongas	Solid	Accommodation Hubs	8,000	KG	=5*1600	5kg per 1600 beds	Reuse	NA	NA	Return to Supplier (eg. Sheridan recycling program)
Demobilisation	Non-regulated waste	Steel	Formwork (extenal and internal)	Solid	Accommodation Hubs	Not estimated	NA	No formula	Subject to detailed design, procurement strateg	Recycle	NA	NA	Townsville/Mt Isa steel recycling
Demobilisation	Non-regulated waste	Timber	Modular walkways, decking, stairs, other	Solid	Accommodation Hubs	300	m3	No formula	50m3 per camp	Dispose	Waste storage area	NA	Auction
Demobilisation	Non-regulated waste	Road base	Trafficked areas	Solid	Accommodation Hubs	10,500	m3	=70000*0.15	As per stormwater design, nominally 60% of ~12ha	Dispose	NA	NA	Landfill Investigate options to leave insitu
Demobilisation	Non-regulated waste	Concrete	Undercover facilities, MVW, waste storage, other	Solid	Accommodation Hubs	4,500	m3	=15000*0.3	1.5ha per camp, 300mm depth	Dispose		NA	Landfill Invetigate options for beneficial reuse/Auction
Demobilisation	Non-regulated waste	Dongas	Staffing	Solid	Accommodation Hubs	400	Dongas	No formula	Not estimated, onhire/contract	Reuse	NA		Offhire/Auction
Demobilisation	Non-regulated waste	White goods	Kitchens	Solid	Accommodation Hubs	60	fridge/freezers	No formula	10 fridge/freezers per camp	Recycle	NA	NA	Auction
Demobilisation	Regulated waste	Grease trap tanks	Kitchens	Solid	Accommodation Hubs	6	tanks	No formula	5000L tanks	Dispose	NA	NA	Landfill
Demobilisation	Regulated waste	Macerators		Solid	Accommodation Hubs	400	Macerators	No formula	1 macerator per 4 containers, assume 400 cont	Dispose	NA	NA	Landfill
Demobilisation	Non-regulated waste	HDPE pipe	Water, electrical, sewer, other	Solid	Accommodation Hubs	TBD	TBD	No formula	Not estimated, subject to plumbing and drainage design	Dispose	NA	Buried	Landfill
Demobilisation	Non-regulated waste	Water treatment plant	Water treatment plant operation	Solid	Accommodation Hubs	NA	NA	No formula	Formwork/modular facilities, recoverable	Reuse	NA	NA	Offhire/Auction
Demobilisation	Non-regulated waste	Sewage treatment plant	Sewage treatment plant operation	Solid	Accommodation Hubs	NA	NA	No formula	Formwork/modular facilities, recoverable	Reuse	NA	NA	Offhire/Auction
Demobilisation	Regulated waste	Irrigation Pipe	Effluent irrigation at camps	Solid	Accommodation Hubs	50	km	=0.05*1000	50mm pipe Assume 1km over nominal 2.5 ha	Dispose	NA	NA	Landfill
Demobilisation	Regulated waste	Sprinklers - steel	Effluent irrigation at camps	Solid	Accommodation Hubs	300	sprinklers	No formula	1m high wrought iron pipe, Assume 50 sprinklers	Recycle	NA	NA	Townsville/Mt Isa steel recycling
Demobilisation	Non-regulated waste	Standpipes	Water sources	Solid	Water supply points	50	standpipe	No formula	25 (1/4 of proposed locations, as these will relocate with the fronts), with some residual for maintenance and piling	Recycle	NA		Townsville/Mt Isa steel recycling
Demobilisation	Non-regulated waste	HDPE pipe	Water sources	Solid	Water supply points	150	m2	=20*0.15*50	Assume 20m per standpipe, of 150mm pipe	Reuse	NA	NA	Landholder beneficial reuse
Demobilisation	Non-regulated waste	Bulk soil	Water sourcs - turkey nests	Solid	Water supply points	NA	NA	No formula	Not calculated as balanced earthworks onsite	Reuse	NA	Fill in, respread on site, if not retained for the landholder	Land management
Demobilisation	Non-regulated waste	HDPE Liner	Water sourcs - turkey nests Concrete washouts	Solid	Water supply points Concrete washouts	17,000	m2	=(20*50)+16000	assume 20m2 per dam, x 50 dams 1 concrete pit per tower, 10m2	Dispose	NA	NA	Landfill Investigate options for beneficial reuse
Demobilisation	Regulated waste	Polyehthlene plastic bunding	Chemical storage	Solid	Accommodation Hubs	300	pallets	No formula	Preferably use DG containers within internal bunding; external bunding for ad hoc chemical storage, 50per camp	Recycle	Waste storage area	Washed for reuse at Motor Vehicle Workshop	Landholder beneficial reuse
Demobilisation	Non-regulated waste	Formwork	Washdown bay	Solid	Camps and alignment	16	Washdown bays	No formula	Crompise tanks, pumps	Recycle	NA	NA	Auction
Demobilisation	Regulated waste	Steel	Refuelling tank	Solid	Accommodation Hubs	12	Refuelling tanks	No formula	2 x 25000L tanks/containers at each camp	Recycle	NA	NA	On hire, returned to supplier
Demobilisation	Regulated waste	Washdown bay - contaminated soil (post removal)	Biosecurity	Solid	Camps and alignment	5,520	m3	=400*46*0.3	6 permanent sites, 40 rolling sites assuming each bay moves 4 times, assume 20x20m, remove 300mm depth	Dispose	NA	NA	Landfill
Demobilisation	Regulated waste	Refuelling bay - contaminated soil (post removal)	Refuelling	Solid	Accommodation Hubs	2,880	m3	=1600*6*0.3	6 permanent sites, 1600m2 each assume 2 tanks at 20m2 each, remove 300mm depth	Dispose	NA	NA	Landfill
Demobilisation	Regulated waste	Contamianted soil	Motor Vehicle Workshop	Solid	Accommodation Hubs	2,880	m3	=1600*6*0.3	1600m2 each, 300mm depth	Dispose	NA	NA	Landfill
Demobilisation	Regulated waste	Concrete	Motor Vehicle Workshop	Solid	Accommodation Hubs	2,880	m3	=1600*6*0.3	1600m2 each, 300mm depth	Dispose	NA	NA	Landfill
Demobilisation	Non-regulated waste	HDPE fabric	Motor Vehicle Workshop Shade structure (dome/igloo)	Solid	Accommodation Hubs	6	domes	No formula	9m width, 5m high (Container mounted)	Recycle	NA	NA	Return to supplier
Demobilisation	Non-regulated waste	Formwork	Motor Vehicle Workshop Shade structure (dome/igloo)	Solid	Accommodation Hubs	6	domes	No formula	9m width, 5m high (Container mounted)	Recycle	NA	NA	Townsville/Mt Isa steel recycling
Demobilisation	Regulated waste	Formwork	Motor Vehicle Workshop - Oily water separator	Solid	Accommodation Hubs	6	Oily water separators	No formula		Recycle	NA	NA	Return to Supplier
Demobilisation	Non-regulated waste	Shipping Containers - Storage	Laydown	Solid	Accommodation Hubs	36	Shipping containers	No formula	Assume 6 per camp, offhire/auction	Reuse	NA	NA	Offhire/Auction
Demobilisation	Regulated waste	Shipping Containers - DG	Laydown	Solid	Accommodation Hubs	12	Shipping containers	No formula	2 per camp	Reuse	NA	NA	Offhire/Auction
Demobilisation	Non-regulated waste	Formwork	Concrete Batching Plant	Solid	Accommodation Hubs	6	Concrete batching plants	No formula	Concrete batching plant and equipment, offhire	Reuse	NA	NA	Offhire, return to Supplier
Demobilisation	Non-regulated waste	Coreflute	Signage	Solid	All	3,220	Signs	=1600+250+940+180+250	1600 tower signs, 250 turn ins potential, 940km signage, camp signage x 180, environmental signage x 250	Recycle	Waste storage area	NA	To be determined Steel signage to be recyclced
Demobilisation	Non-regulated waste	Star pickets	Sigange, barricading	Solid	All	2,610	Star pickets	=0.5*3220+1000	50% singage support + 1000 ad hoc	Recycle	Waste storage area	NA	Townsville/Mt Isa steel recycling Auction/Landholder beneficial use
Demobilisation	Non-regulated waste	Firefighting equipment	Alignment and substations	Solid	All	To be determined		No formula	Water tanks, fire fighting equipment: trailers/extinguishers	Recycle	Waste storage area	NA	End use as per waste service provider recycling contract
Demobilisation	Non-regulated waste	Steel fence materials	Fencing	Solid	Accommodation Hubs	12	KM	No formula	1.8m high fencing, 2km per camp	Recycle	Waste storage area	NA	Townsville/Mt Isa steel recycling
Substations	Non-regulated waste	Steel offcuts	Structures, fencing, reo-cages, mesh, cabling, other	Solid	Substations	10% excess of BOQ		No formula	Subject to detailed design	Recycle	Waste storage area	NA	Townsville/Mt Isa steel recycling
Substations	Non-regulated waste	Concrete	Concrete Washout	Solid	Substations	10% every 1m3		No formula	Subject to detailed design	Dispose	Concrete washout facilities	Evaporation	Landfill Beneficial reuse to be investigated
Substations	Non-regulated waste	Timber pallets	Packaging	Solid	Substations	3,600	m3	=600*6	Pers comm Kevin Beer, Mt Fox example 600m3	Dispose	Waste storage area	NA	
Substations	Non-regulated waste	Carboard	Packaging	Solid	Substations	780	m3	=6*52*2.5	6m3 change out weekly per substation x 6	Recycle	Waste storage area	NA	Bailed End use as per waste service provider recycling contract
Substations	Non-regulated waste	Plastics and strapping/co mingled recycling	Packaging	Solid	Substations	5,616	m3	=6*6*156	6m3 change out weekly per substation x 6	Recycle	Waste storage area	NA	To be determined

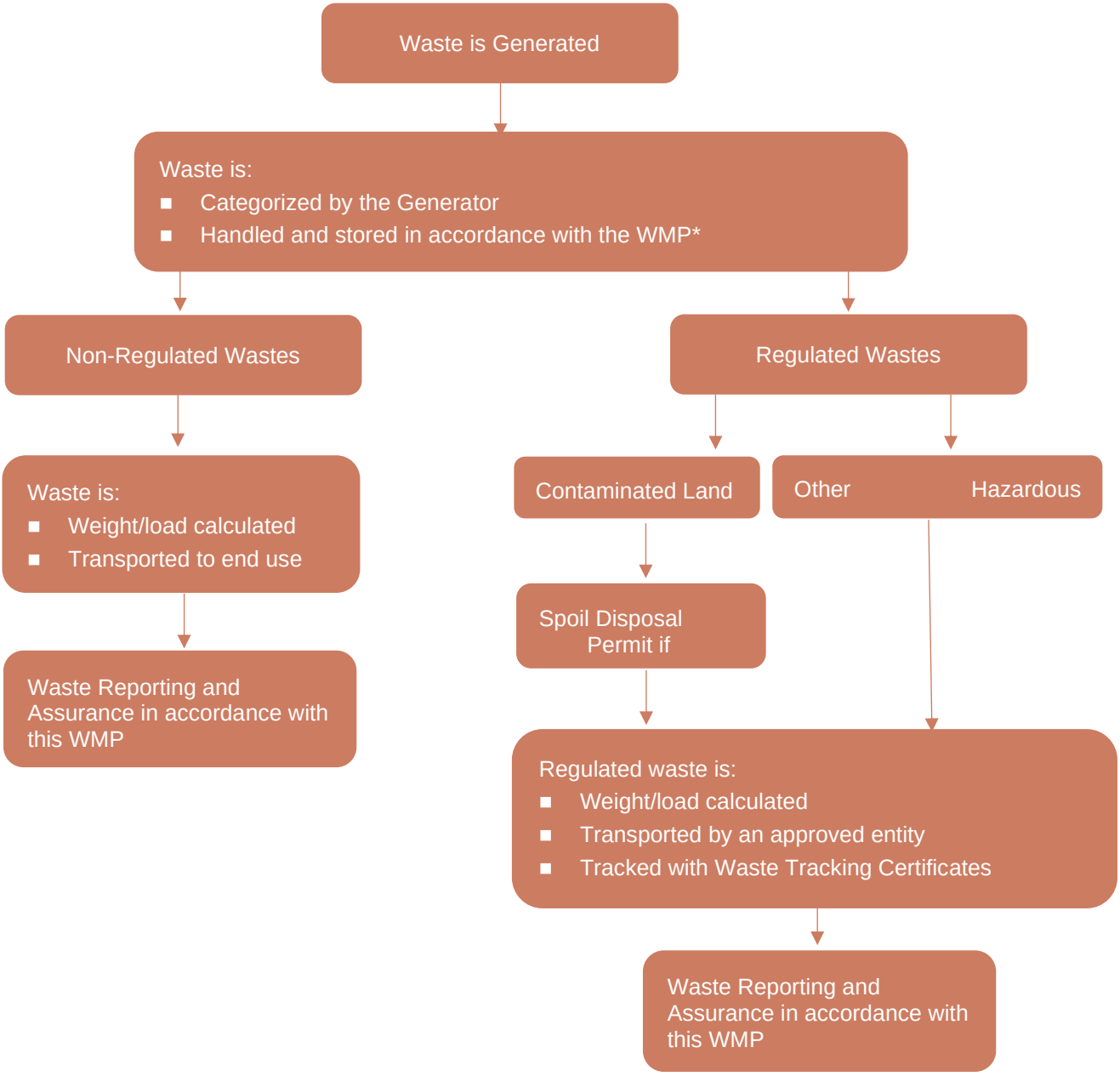
Initial Waste Assessment

Stage	Waste Category	Waste Stream	Source Activity	Solid/Liquid	Location	Current Estimate	Units	Current Estimate	Calc Assumptions	Waste Hierarchy	Storage	Onsite Treatment	End Use Location
Substations	Non-regulated waste	Electrical conduits offcuts	Electrical	Solid	Substations	5% excess of BOQ		No formula	Subject to detailed design	Dispose	Waste storage area	NA	
Substations	Non-regulated waste	Excess spoil	Civil/foundations	Solid	Substations	Equal to foundation earthworks		No formula	Subject to detailed design	Dispose	Stockpiles		
Substations	Regulated waste	Septic	Staffing	Liquid	Substations	NA	NA	No formula	Calculated as part of accommodation hubs effluent rates. Separate locations require internal movement	Dispose	Bulky Tanks	NA	Sewage Treatment Plant insitu
Substations	Non-regulated waste	Safety fencing/netting	Safety requirements	Solid		1,000	M	No formula	assume 1000m total, convert to weight	Dispose	Waste storage area	NA	Landfill Beneficial reuse to be investigated

Appendix B Council Landfill Facilities

Council	Facility	Waste Accepted	Opening Days	Opening Hours	Comments	For Use by Project
Townsville City Council	Stuart Waste Facility	General waste Regulated waste	7 days	6.30am to 5.45pm	Paints, solvents, chemical wastes and liquid wastes are not accepted by this facility.	Yes
Burdekin Shire Council	Kirknie Landfill	General waste Limited regulated waste	Monday to Friday Saturday	8.00am to 4.30pm 8.00am to 12.00pm	Currently known to receive 8000t/pa and has capacity to take project waste paints, chemicals, oily rags, liquid waste. Any other reg waste not specified above is not able to be accepted by this facility.	No
Charters Towers Regional Council	Stubley Street Landfill & Resource Recovery Area	General waste Limited regulated waste	7 days	8.00am to 5.00pm	Currently known to receive around 13,000t/pa and has capacity to take project waste	Potential
Flinders Shire Council	Hughenden Landfill	General waste Regulated waste	Monday to Friday Saturday to Sunday	8.00am to 11.00am 3.00pm to 6.00pm 8.00am to 11.00am 2.00pm to 6.00pm	Small capacity - can take regulated waste but only up to 10% of total waste received.	No
Richmond Shire Council	Richmond Waste Disposal Facility	General waste Regulated waste	7 days	6.00am to 6.00pm		No
McKinlay Shire Council	Julia Creek Recycling and Waste Management Facility	General waste Limited regulated waste	Monday to Friday	7.00am to 3.30pm		No
Cloncurry Shire Council	Cloncurry Landfill	General waste Regulated waste	7 days	8.00am to 12.00pm 1.00pm to 6.00pm	No regulated waste accepted.	No
Cloncurry Shire Council	Cloncurry Regulated Waste Facility	General waste Regulated waste			Cannot accept chemicals, chemical containers, hydrocarbons (including oily rags/ filters), tyres, batteries, paints, liquid waste.	No
Mount Isa City Council	Mount Isa General and Regulated Waste Disposal Facility	General waste Regulated waste	7 days	7.30am to 4.45pm	No liquid waste accepted. MRF under construction.	Yes

Appendix C Waste Management Procedure



*Requirements for the safe handling of hazardous substances will be identified in this Plan in the next revision once safety risk assessments are undertaken.

COPPERSTRING 2032

COPPERSTRING 2032 JV

BIOSECURITY MANAGEMENT PLAN

COPPERSTRING 2032

EDMS No : CSPW-EVN-PLN-900-000012
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IFR

Approvals and Reviews

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A01	Developed for PDLA Work Contract	Rasuejah Achior	David McLean	Matt Lennon	03/05/2024
A02	Updated in response to comments	Jacinta Fuller	David McLean	Matt Lennon	13/06/2024

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Appendices

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1. Introduction

The purpose of the CopperString 2032 project is to connect the North West Minerals Province (NWMP) of Queensland to the National Electricity Grid. This will not only allow existing loads in the Mt Isa and Cloncurry areas to be fed from the National Electricity Market (NEM), but also provide access to new mining loads and opportunity for connection of renewable generation.

1.1 Project scope

The CopperString 2032 Project is an extra high voltage transmission system intended to connect the North West Power System (NWPS) near Cloncurry and Mount Isa to the Powerlink network and NEM at Mulgrave. Figure 1 provides an overview of the Project.



Figure 1 CopperString 2032 proposed transmission lines and substations

The CopperString 2032 Project will connect the NWMP to the NEM to reduce the cost of power supply and facilitate the large-scale development of the Hughenden wind resource and solar resources within the North Queensland Clean Energy Hub (NQCEH).

The scope of work, traversing east to west, consists of the following sections:

- Mulgrave 500/275kV Substation as the CopperString 500kV connection point to the Queensland SuperGrid and 275kV line augmentation as the CopperString 275kV connection point to the NEM
- Pentland 500kV Substation to support the North Queensland Clean Energy Hub (NQCEH) expansion and as the core for future load connections in the area
- Flinders 500/300kV Substation (Hughenden) as the core for the NQCEH
- Dajarra Road 330/220kV Substation (Cloncurry) as the core for distributions to larger load centres
- The primary CopperString transmission backbone
- Termination via the Mount Isa augmentation 220/132kV.

The scope consists of a transmission line between the above locations carrying extra high voltage power transmission at 500kV, 330kV and 220kV respectively. Substations at the abovementioned interconnecting junctions will distribute power to the NWMP and NQCEH.

1.2 Abbreviations, acronyms & definitions

Table 1 Abbreviations, acronyms & definitions

Abbreviation	Definition
AS	Australian Standard
BMP	Biosecurity Management Plan
CAL	Country Action List
CEMP	Construction Environmental Management Plan
CHMP	Cultural Heritage Management Plan
CM	Construction Manager
CoG	Coordinator General's Evaluation Report (September 2022)
DAF	Department of Agriculture and Fisheries
DCCEW	Department of Climate Change, the Environment and Water
DES	Department of Environment and Science
DNRME	Department of Natural Resources, Mines and Energy
EA	Environmental Advisor
EIS	Environmental Impact Statement
EM	Environmental Manager
EMF	Environmental Management Framework
EMS	Environmental Management System
EP Act	*Environmental Protection Act 1994* (QLD)
EWMS	Environmental Work Method Statement
GIS	Geographical Information System
HSE	Health, Safety and Environment
NEM	National Electricity Market
NWMP	Northwest Minerals Province
NWPS	Northwest Power Systems
PQ	Powerlink QLD
SCHS	Sea Container Hygiene System
SYNERGY	The JV Online Incident and Event Reporting
UGL CPB JV	UGL, CPB Contractors Pty Limited Joint Venture
UGLMS	UGL Management Systems
VPEM	Vehicles, Plant, Equipment and Machinery

2. Project Environmental Management Obligations

The Project involves construction and operation of approximately 1,000km of extra high voltage overhead electricity transmission line that will connect the Northwest power system to the state electricity grid. The project includes six (6) new substations, electricity transmission line and transmission towers every 500-600 meters (m). To support construction of the project six construction camps, site offices, laydown/delivery areas, concrete batching plants, and access tracks to the corridor and along its alignment will be provided. The project also provides for improved communications, with the installation of fibre optic cables.

The Coordinator General (CoG) for the Department of State Development, Infrastructure, Local Government and Planning declared the project to be a 'coordinated project' under *the State Development and Public Works Organisation Act 1971* (SDPWO) requiring an Environmental Impact Statement (EIS) for the Project. In September 2022, the Coordinator General provided an evaluation report (CoG Report) on the submitted EIS for the project. This report includes an evaluation of Matters of National Significant (MNES) with recommended conditions for an approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth). In November 2022, a notification of approval was granted from the Department of Climate Change, Energy, the Environment and Water (DCCEEW) (Commonwealth) under the EPBC Act with conditions specific to the Project.

The CoG report also includes recommended conditions for proposed subsequent Ministerial Infrastructure Designations for consideration under the *Planning Act 2016* (Qld) by the Queensland Planning Minister.

The CoG evaluation was based on the draft and revised EISs, submissions made, public consultation on the draft EIS and advice from relevant Australian, State and Local government agencies.

To address and comply its legislative obligations, the UGLCPB JV has prepared a Regulatory Approvals Plan which identifies the environmental approvals applicable to the Project.

The project scope includes (but not limited to):

- Clearing vegetation and earthworks for a transmission line and ancillary infrastructure (e.g. off-easement access tracks and water sources) involving:
  - Disturbance to Matters of National Environmental Significance
  - Disturbance to Matters of State Environmental Significance
  - Interfering with protected species (flora and fauna) and
  - Works within Native Title claimed areas
  - Land affected by Unexploded Ordnance (UXO)
- Constructing and operating accommodation hubs with facilities including:
  - Clearing regulated vegetation
  - Accommodation units and offices, and carparking (involving building and plumbing and drainage works)
  - Mains connection (power, water and sewerage)
  - Mobile and temporary concrete batching plants
  - Motor vehicle workshop
  - Fuel (chemical) storage
  - Water treatment, for provision of drinking water
  - Wastewater (sewage) treatment
  - Biosecurity washdown bays
- Taking water (surface and groundwater)
- Use of quarry material from commercial sources, although project specific borrow pits may be identified as an opportunity
- Crossing mapped waterways and water courses for access
- Upgrading public roads
- Working within and adjacent to rail corridors

- Disposing of contaminated soil (if found within properties listed on the Environmental Management Register (EMR)).

2.1 Relevant legislation and guidelines

2.1.1 Federal

- *Biosecurity Act 2015*
- *Environment Protection and Biodiversity Conservation Act 1999*.

2.1.2 State

- *State Development and Public Works Organisation Act 1971*
- *Environmental Protection Act 1994*
- *Biosecurity Regulation 2016*
- *Queensland Agricultural Chemicals Distribution Control Act 1966*
- *Queensland Public Health Act 2005*
- *Mosquito Management Code of Practice 2014*
- *Biosecurity Act 2014*.

2.1.3 Local Government

- Local Council Biosecurity Plans
- Burdekin Shire Council Biosecurity Plan 2016 – 2019 V2.2
- Draft Townsville Local Government Area Biosecurity Plan 2017 – 2021
- Charters Towers Regional Council Biosecurity Plan 2019 – 2024
- Northwest Queensland Regional Biosecurity Plan 2022 – 2027.

2.1.4 Standards and Guidelines

- Vehicle and Machinery Cleandown Procedures (QLD, 2019)
- Imported goods: Biosecurity risk treatment guide (Department of Agriculture, Fisheries and Forestry (DAFF), 2017)
- Australian Pest Animal Strategy 2017 – 2027 (Invasive Plants and Animals Committee, 2017)
- Australian Weeds Strategy 2017 – 2027 (Invasive Plants and Animals Committee, 2017)
- Queensland Invasive Plants and Animals Strategy 2019 – 2024 (Department of Agriculture and Fisheries, 2019).

3. Management Plan Interface

3.1 Conditions of approval – requirements and commitments

Table 2 CoG Obligations and Recommendations

Reference	Context	Where addressed
CoG Appendix 2, Recommended Requirement B20	(a) Prior to commencement of works, prepare a biosecurity management plan (BMP). (b) The BMP must be prepared by a person suitably qualified in biosecurity management and include/address (i) alignment with key national, state, and local biosecurity priorities (ii) collaboration with landholders on any existing property specific integrated pest management or biosecurity management plans (iii) known weeds of national significance, restricted, invasive, or regionally declared weeds identified in the project corridor (iv) identification of the origin of high-risk construction materials, machinery, and equipment (v) clean down protocols and locations (vi) management and treatment methods to control spread of weeds (vii) promotion of awareness of weed management among project workers (viii) routine weed monitoring during construction and operation to identify any new incidence of weeds considering weed flowering, setting seed and dispersal. (c) Submit a copy of the BMP to DSDILGP (infrastructuredesignation@dsdilgp.qld.gov.au) (d) Prior to the commencement of works at each location, implement the mitigation measures and recommendations of the BMP.	This Plan
CoG Appendix 2, Recommended Requirement B21	a) Prior to the commencement of works, undertake a site inspection to confirm the presence of any invasive, declared or pest species (flora or fauna). If found, manage these in accordance with the BMP. b) Following the first wet season after completion of works, undertake a site inspection to confirm the presence of any invasive, declared or pest species (flora or fauna). If found, remove these in accordance with legislative requirements.	Table 10 Table 11
CoG Appendix 2, Recommended Requirement B33a (ix)	(a) Prior to the commencement of works, prepare and submit a Construction Environmental Management Plan (CEMP) to DSDILGP (infrastructuredesignation@dsdlgip.qld.gov.au). The CEMP must be consistent with management measures detailed in the project EIS and, and must include/address the following: (ix) a Biosecurity Management Plan	This plan
CoG Appendix 4, Commitment C8	Suitable weed control measures will be implemented during construction and operation of the Project. The Project will consult with local government weed and pest management officers and landholders during the development of Biosecurity Plans for the Project.	Section 5.2
CoG Appendix 4, Commitment C59	A Construction Environmental Management Plan which includes weed and pest management measures will be developed prior to construction commencing. The plan will include details relating to the monitoring,	This plan

Reference	Context	Where addressed
	management and, where necessary, treatment of weeds, disposal of green waste, and vehicle/plant weed washdown protocols.	
CoG Appendix 4, Commitment C63	A CEMP will be prepared and implemented for standards such as weed hygiene, erosion, fuels and hazardous substances, fire, etc. The CEMP will include protocols to limit injury and mortality to fauna including management of risks associated with open excavations, trenching, waterbodies and responses and reporting for roadkill and adverse incident protocols	This plan (for weed hygiene) Flora and Fauna Management Plan
CoG Appendix 4, Commitment C67	Management strategies with reference to biosecurity will be developed to reflect the level of risk proposed for Project activities and Project work fronts.	Section 5.1
CoG Appendix 4, Commitment C68	All relevant personnel working in the field on the Project will receive an induction regarding biosecurity matters and management requirements relevant to their specific work activities and Project work front.	Table 11
CoG Appendix 4, Commitment C69	A weed and pest biosecurity survey will be undertaken over of the corridor selection within six months of construction commencing in that section.	Table 10
CoG Appendix 4, Commitment C70	The Construction Contractor(s) will undertake a detailed assessment of biosecurity risks associated with specific work activities and construction methods	Table 11
CoG Appendix 4, Commitment C71	Prior to leaving their point of origin for access to the Project site, all vehicles, plant, equipment, and machinery shall be cleaned down and be accompanied by a current and certified Biosecurity Declaration Form from the entity responsible for the clean down.	Appendix C
CoG Appendix 4, Commitment C72	CopperString will develop and implement a movement control plan and species-specific biosecurity treatment procedures.	Table 11
CoG Appendix 4, Commitment C73	Biosecurity will be managed in accordance with the Construction Environment Management Plan, Prior to leaving a Project work front, or moving between Project work fronts or biosecurity risk areas, all vehicles, plant, equipment, and machinery shall undergo clean down at designated facilities and a new Biosecurity Declaration Form completed. Any specific landholder requirements will also be noted apart of the clean down requirements.	Section 5.2.4 Appendix B Appendix C
CoG Appendix 4, Commitment C98	Where necessary, restricted invasive plants material will be disposed in accordance with the biosecurity measures in the CEMP.	Table 10 Table 11
CoG Appendix 4, Commitment C153a	As part of the Project various overarching management plans will be developed and implemented in relation to the broader environmental aspects for the Project • Biosecurity Management Plan	This plan
CoG Appendix 4, Commitment C153b	As part of the Construction Environmental Management Plan, various sub-plans will be developed and implemented in relation to the environmental aspects for the Project • Biosecurity Management	This Plan
CoG Appendix 4, Commitment C164	The proposed mitigations are existing commitments within the EIS which are adequate to also mitigate the cumulative effects of other projects: • Direct impact to areas of high ecological value will be minimised through the process of corridor realignments or spanned across wherever possible using higher towers as appropriate to the ecological values and the terrain constraints. • A Road Use Management Plan (RUMP)and a Traffic Management Plan will be developed for the Project and will include consultation with the	Section 5.2.4 Appendix B Appendix C

Reference	Context	Where addressed
	relevant transport authorities such as DTMR, Queensland Rail and local government councils. • Prior to leaving a Project work front, or moving between Project properties, work fronts or biosecurity risk areas, all vehicles, plant, equipment, and machinery shall undergo clean down.	

3.2 HSE Specification for contractors and suppliers (CSPW-HSW-SPE-M8-000001, revision B)

Reference	Content Requirement	Where addressed
9.8 Biosecurity	Contractors must take all reasonable and practicable measures to ensure no introduction, release, movement, or transportation of biosecurity matters as a result of project activities and discharge Powerlink's General Biosecurity Obligation as defined under the Biosecurity Act 2014.	This Plan
	a) Comply with land access requirements	Table 10 Table 11
	b) Workers must receive a Project specific induction that includes relevant information relating to biosecurity management requirements.	Table 11
	c) An inspection must be completed, and if required, clean down in the following situations: (i) Moving between and outside Biosecurity Queensland Biosecurity Zones (ii) Where vehicles, plant, equipment and machinery move between any nominated Project Biosecurity Areas (iii) Where vehicles, plant, equipment and machinery have traversed a high-risk biosecurity matter (iv) Where personnel, vehicles, plant, equipment and machinery exit a known pathogen or disease risk area (v) Where assessed as reasonable to manage biosecurity risks.	Section 5.2 Appendix B Appendix C
	d) Where an inspection or clean down is required, the worker must: (i) Inspect vehicle, plant, equipment and machinery for biosecurity matter (including soil that may contain biosecurity matter) (ii) Where the vehicle, plant, equipment or machinery are identified to be free of biosecurity matter, a 'biosecurity matters free' declaration form must be completed (iii) Where the vehicle, plant, equipment or machinery contains biosecurity matter, it must be cleaned to remove biosecurity matter, reinspected, and a biosecurity matter free declaration form must be completed.	Section 5.2 Appendix B Appendix C
	e) Vehicle, plant, equipment, machinery and personnel must be disinfected when existing a known pathogen risk area. Actions must be recorded on a 'biosecurity matter free' declaration form.	Section 5.2 Appendix B Appendix C
	f) Where a logbook is nominated as a required control on the EWP, a vehicle movement log form must be completed from time of clean down to destination to demonstrate where the vehicle has travelled during this time.	Appendix B Appendix C
	g) Clean downs must be undertaken in accordance with the Queensland Government's Vehicle and Machinery Clean down Procedures. Clean downs	Section 5.2 Appendix B

Reference	Content Requirement	Where addressed
	should be undertaken at designated locations. Where clean downs are required to be completed at one-off locations, the site must: (i) Be selected at the edge, or nearby to any areas where weeds or pathogens need to be contained (ii) Be selected in consultation with/agreement from the landholder (iii) Ensure runoff will not enter any watercourse or waterbody (iv) Avoid sensitive vegetation (v) Be selected in mud free locations which gently drain away from the clean down location.	Appendix C
	h) Workers required to self-certify or certify other vehicles, plant, equipment and machinery (VPEM) must have the following qualification, AHCBIO201 Inspect and clean machinery for plant, animal and soil material (or an equivalent competency).	Section 5.2 Appendix B Appendix C
	i) Vehicle journey planning must be undertaken, as far as practicable, in order to visit biosecurity free areas first, before travelling to areas affected by biosecurity matters.	Section 5.2
	j) Avoid or minimise travel through areas heavily affected by biosecurity matters wherever possible.	Section 5.2
	k) Established roads and tracks will be utilised where practicable, with slashing and gravelling to be considered in areas of high-volume traffic.	Section 5.2
	l) Ground disturbance and removal of native or pastoral ground cover should be kept to a minimum.	Section 5.2
	m) Biosecurity Declarations must be provided for all high-risk material (e.g., sand, soil, mulch etc.), from suppliers of these products. Quantities of soil/gravel obtained from a land holders borrow pit must have a Biosecurity Declaration (excluding movement of material within the same property).	Section 5.2
	n) Any loads of plant material or soil (that may contain biosecurity matter) must be covered during transport.	Section 5.2
	o) Powerlink and its Contractor must participate as required with any Queensland Government biosecurity directives for managing emergency situations.	Section 5.2
	p) Regular monitoring of the easement and access tracks must be undertaken to identify any new outbreaks.	Section 5.3
	q) Appropriate disposal of material potentially contaminated with biosecurity matter shall be undertaken in accordance with *Biosecurity Act 2014* requirements.	Section 5.2

3.3 References

Document title	Document ID / Relevant Sections
CopperString 2.0, Supplement to the Draft Environmental Impact Statement, Volume 4, Jan 2022	Biosecurity Volume 3 Chapter 8
Framework Environmental Management Plan (appendix Q of the EIS)	Section 4 Figure 2 (this plan)

Document title	Document ID / Relevant Sections
CopperString2032, Powerlink – HSE Specification for Contractors and Suppliers, version B	CSPW-HSW-SPE-M8-000001 Section 9
Construction Environmental Management Plan	0643-JV-PLN-CEM-0003
Regulatory Approvals Plan	9310-JV-PLN-RAP-0039
Erosion and Sediment Control Management Plan	9310-JV-PLN-ESC-0045
Vegetation Management Plan	0643-JV-PLN-VMP-0048
Site Environmental Plan (template)	UGLMS-4-2138
Pest Management	UGLMS-131-544
Weed Management	UGLMS-131-391
Land Access Protocol	Powerlink Queensland
Northwest QLD Regional Biosecurity Plan 2022 – 2027	
Townsville City Biosecurity Plan 2020 – 2024	
Charters Towers Regional Council Biosecurity Plan 2019 – 2024	
Land Access Permits	Powerlink Queensland
Landholder requirements register	Powerlink Queensland

4. Biosecurity Management Plan

This sub-plan has been developed to comply with conditions of the project approval, the Environmental Management Framework (Figure 2) and UGL's certified Environmental Management System.

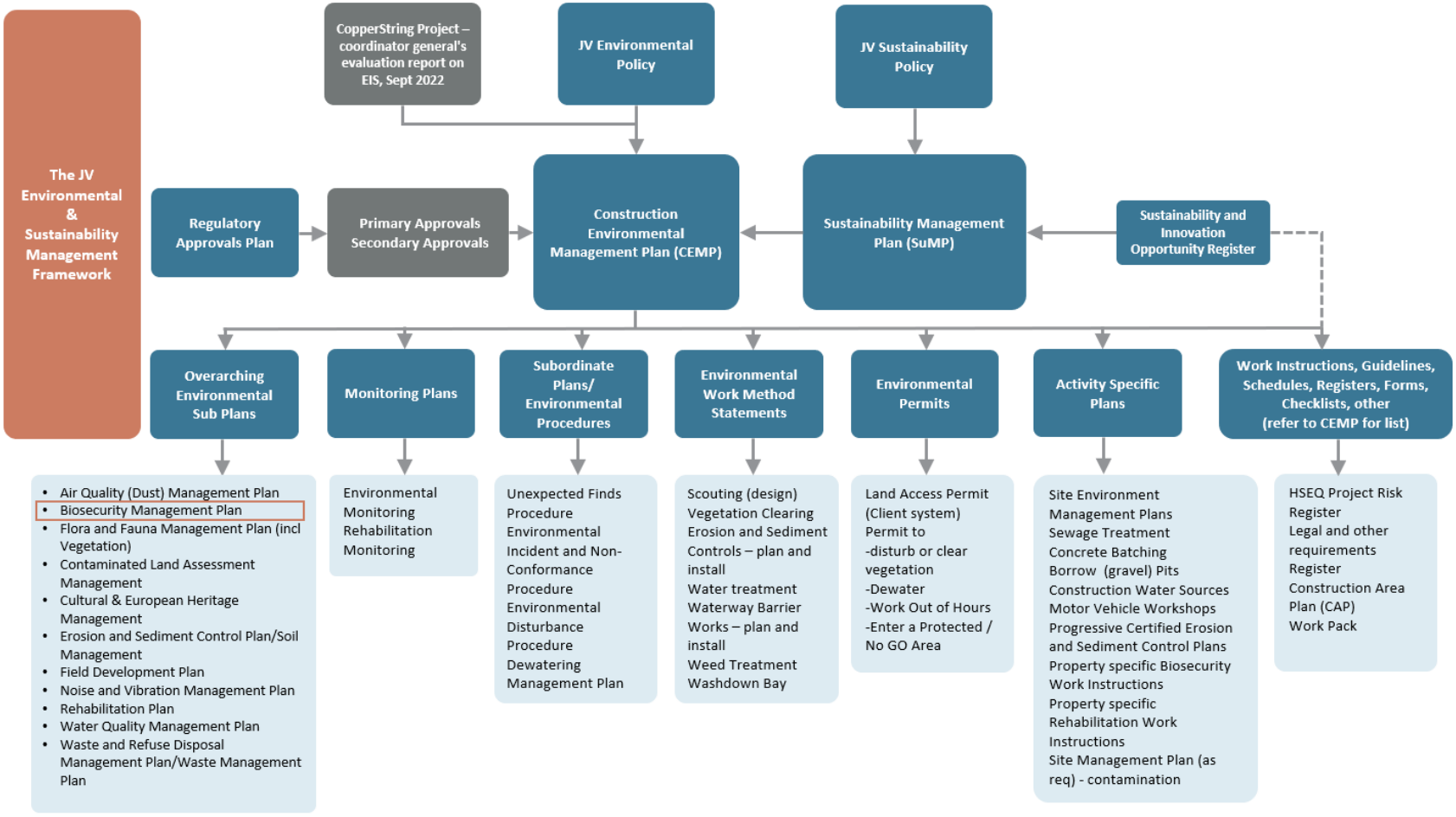


Figure 2 JV Environmental Management Framework

4.1 Management plan purpose

The sub plan at minimum will aim to ensure that construction of the project is compliant with all relevant provisions and will include:

- Collaboration with landholders on any existing property specific integrated pest management or Biosecurity Management Plans.
- Specific biosecurity management plans (if necessary) would be developed by the principal Construction contractor/s prior to construction in consultation with a qualified ecologist/hygienist and with the landholder/s
- Compliance with relevant provisions of the *Biosecurity Act 2014*, Commonwealth weed and pest strategies, biosecurity plans, Weeds of National Significance, and designated pests under the Public Health Act 2005.
- Biosecurity management measures/actions that may be required for:
  - Weeds of national significance
  - Restricted or invasive weeds
  - Regionally declared weeds
  - Conservation of significant vegetation communities or flora species
  - Conservation of significant fauna species habitat
  - Riparian vegetation corridors or waterbodies
  - Landholder specific agreements
  - Landholder specific biosecurity management plan
  - Identification of the origin of high-risk construction vehicles, plant, equipment, and materials (VPE)
  - Clean down protocols and locations
  - Management and treatment methods to control the spread of weeds
  - Promoting awareness of weed management among project workers
  - Routine weed monitoring during construction and operation to identify any new incidence of weeds considering weed flowering, setting seed and dispersal.

This BMP applies to the construction phase of the project only. It does not apply to operational or decommissioning activities.

4.2 Objectives

- No introduction, release, movement, or transportation of biosecurity matters onto the Client's Site, due to construction activities.

4.3 Performance/target criteria

- No introduction of flora, fauna, and/or organisms that may impact on the native ecosystem.
- No movement/transportation of flora, fauna, and/or organisms that may impact on endemic environment.
- Implement treatment methods for weed and pests found.

5. Existing Environment

5.1 Management and mitigation measures

5.1.1 Restricted matter

There are 7 categories of restricted matter (Table 3). Each category places restrictions on the dealings with the biosecurity matter or requires actions to be taken to minimise the spread and adverse impact of the biosecurity matter. A pest animal or weed may be classified under multiple categories.

Table 3: Restricted matter categories

Category	Detail
Category 1 Must be reported to an inspector	Biosecurity Queensland needs to be made aware of this restricted matter to take action to contain and eradicate it. Category 1 restricted matter must be reported to a DAF inspector within 24 hours of becoming aware of its presence.
Category 2 Must be reported to an authorised officer	Biosecurity Queensland needs to be aware of this restricted matter to commence appropriate actions to reduce, control or contain the biosecurity matter. This restricted matter must be reported to an inspector or authorised person within 24 hours of you becoming aware of its presence.
Category 3 Not to be distributed or disposed	This restricted matter must not be distributed. This means it must not be given as a gift, sold, traded, or released into the environment unless the distribution or disposal is authorised in a regulation or under a permit. Deliberate human distribution or disposal contrary to the legislation is a key source of spread.
Category 4 Not to be moved	This restricted matter must not be moved to ensure that it does not spread.
Category 5 Not to be kept	This restricted matter must not be possessed. These pests have a high risk of negatively impacting on the environment. This restricted matter may only be kept under a permit of the *Biosecurity Act 2014* or another Act.
Category 6 Not to be fed	This restricted matter must not be fed. Feeding this restricted matter may cause their numbers to increase and negatively impact the economy or the environment. Feeding for the purpose of preparing for or undertaking a control program is exempted.
Category 7 Must be killed	If these noxious fish are in a person's possession, they must kill the restricted matter and dispose of the carcass by burying the whole carcass (no parts removed) in the ground above the high tide water mark or placing it in a waste disposal receptacle.

5.1.2 Invasive plants – State and Commonwealth

Table 4 Invasive Plants

Scientific Name	Common Name	Management Level		Recorded During Field Surveys *
		WoNS	Restricted Invasive plant	
Bryophyllum delagoense	Mother of millions	-	Category 3	Y
Cascabela thevetia	Yellow oleander	-	Category 3	
Cabomba caroliniana	Cabomba	-	Category 3	
Cenchrus ciliaris	Buffel grass	-	-	
Chromolaena odorata	Siam weed	-	Category 3	
Cryptostegia grandiflora	Rubber vine	Y	Category 3	Y
Cryptostegia madagascariensis	Ornamental rubber vine	-	Category 3	
Cylindropuntia fulgida	Coral cactus	-	Category 3	

Scientific Name	Common Name	Management Level		Recorded During Field Surveys *
		WoNS	Restricted Invasive plant	
Cylindropuntia fulgida var. mamillata	Prickly pear	Y	Category 3	
Cyperus brevifolius	Mullumbimby couch	-	-	
Eichhornia crassipes	Water hyacinth	Y	Category 3	
Harrisia martini	Harrisia cactus	-	Category 3	
Hymenachne amplexicaulis	Hymenachne	-	Category 3	
Jatropha gossypiifolia	Bellyache bush	Y	Category 3	Y
Lantana camara	Lantana	Y	Category 3	Y
Lycium ferocissimum	African boxthorn	-	-	
Opuntia monacantha	Dropping tree pear	Y	Category 3	
Opuntia stricta	Prickly pear	Y	Category 3	Y
Opuntia tomentosa	Velvety tree pear	Y	Category 3	Y
Parkinsonia aculeata	Parkinsonia	Y	Category 3	Y
Parthenium hysterophorus	Parthenium weed	Y	Category 3	Y
Prosopis pallida	Mesquite	Y	Category 3	
Salvinia molesta	Salvinia	Y	Category 3	
Senna obtusifolia	Sicklepod	-	Category 3	
Sphagneticola trilobata	Singapore daisy	-	Category 3	
Sporobolus jacquemontii	America rat's tail grass	-	Category 3	
Sporobolus pyramidalis	Giant rat's tail grass	-	Category 3	
Tamarix aphylla	Athel pine	Y	Category 3	
Tecoma stans	Yellow bells	-	Category 3	Y
Thunbergia grandiflora	Thunbergia	-	Category 3	
Vachellia nilotica	Prickly acacia	Y	Category 3	Y
Ziziphus mauritiana	Chinee apple	-	Category 3	Y

* Note: recorded during field targeted field surveys for the Copperstring Project EIS (CuString, 2010) or Copperstring Project Supplementary EIS (CuString, 2011)

5.1.3 Invasive animal species – State and Commonwealth

Table 5 Invasive Animal Species

Scientific Name	Common Name	Restricted Matter Category
Canis lupus familiaris	Domestic dog	Category 3, 4, 6
Felis catus	Cat	Category 3, 4, 6
Oryctolagus cuniculus	European rabbit	Category 3, 4, 5, 6
Sus scrofa	Pig	Category 3, 4, 6
Vulpes vulpes	Red fox	Category 3, 4, 5, 6
Rhinella marina	Cane toad	-

Scientific Name	Common Name	Restricted Matter Category
Acridotheres tristis	Common myna	-
Anas platyrhynchos	Northern mallard	-
Bos taurus	Cattle	-
Camelus dromedarius	One-humped camel	-
Columba livia	Rock Dove	-
Hemidactylus frenatus	House gecko	-
Lonchura punctulata	Nutmeg mannikin	-
Mus musculus	House mouse	-
Pavo cristatus	Indian peafowl	-
Passer domesticus	House sparrow	-
Spilopelia chinensis	Spotted dove	-
Equus caballus	Horse	-
Sturnus vulgaris	Common starling	-
Rattus rattus	Black rat	-
Capra hircus	Goat	Category 3, 4, 6
Cervus elaphus	Feral deer	Category 3, 4, 6
Gambusia holbrooki	Mosquitofish	Category 6 and 7
Oreochromis mossambica	Tipalia	Category 6 and 7

5.1.4 Invasive insects

Table 6 Invasive Insects

Scientific Name	Common Name	Restricted Matter Category	Known Location
Wasmannia auropunctata	Electric ant	Category 1	Far North Queensland
Solenopsis invicta	Red imported fire ant	Category 1	South-east QLD
Anoplolepis gracilipes	Yellow crazy ant	Category 3	Townsville, Cairns, Brisbane
Monomorium destructor (also known as Trichomyrmex destructor)	Singapore ant	-	McKinlay LGA urban districts (Julia Creek, McKinlay, Kynuna and Nelia Townships)

Table 7 Management thresholds under QLD weed and pest animal strategy (QW&PAS 2019 – 2024)

Management Objective	Description
Prevention and Early Intervention – Maintain QLD's pest-free status	• Prevent the introduction of the pest species • Remove pest species from trade • Isolate any known incursions of the pest species and eradicate immediately • Monitor any reported sightings of the pest species
Eradication – Return QLD to pest-free status	• Remove all pest plants and exhaust the seed bank • Remove all pest animals • Prevent the spread of pest species reproductive material

Management Objective	Description
	• Prevent reintroduction of pest species • Remove the pest species from trade
Containment A – Create an exclusion zone with prevention and eradication objectives, and actively reduce infestation inside containment area	• Remove/treat all pest plant and exhaust seed bank • Remove all pest animals • Prevent the spread of pest species reproductive material • Prevent reintroduction of pest species to containment area • Remove the pest species from trade • Take all reasonable actions to prevent the spread and remove pest animal populations
Containment B – Create an exclusion zone with prevention and eradication objectives, and manage species as per best practice to reduce impacts on priority assets within the containment are	• Ensure actions are taken to prevent pest entry into other areas • Prevent the spread of pest species reproductive material out of the containment area • Minimise the spread of pest species reproductive material into areas under active control • Remove all pest species from trade • Take all reasonable actions to control, prevent or limit spread of pest animals.
Asset Protection – Reduce the overall economic, environmental, and/or social impacts of the species, including targeted management to protect key sites/assets	• Reduce impacts of pest species on assets • Minimise the spread of pest species reproductive material into uninfected areas or into areas under the active control • Remove the pest species from trade
Watch List – unlikely to establish in area	• Pest species risk has been considered and currently does not pose a biosecurity threat • Ongoing periodic monitoring of pest species to confirm status • The pest species is unlikely to be targeted for coordinated control unless it's impacts increase and pose a threat.

5.1.5 Local Government priority for invasive weed and animal species

Table 8 Local Government priority for invasive weed and animal species

Species		Local Government/Council Priority							
Scientific Name	**Common Name**	**Burdekin Shire**	**Townsville**	**Charters Towers**	**Flinders**	**Richmond**	**McKinlay**	**Cloncurry**	**Mt Isa**
Bryophyllum delagoense	Mother of millions	-	Medium	Low/Medium	Containment A	Containment A	Containment A	Prevention and early intervention	Containment A
Cascabela thevetia	Yellow oleander	Medium	Medium	Medium	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention	Containment A and Prevention and early intervention	Prevention and Early Intervention, Containment B
Cabomba caroliniana	Cabomba	Medium	Critical Priority	-	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and early intervention	Prevention and Early Intervention	Prevention and Early Intervention
Cenchrus ciliaris	Buffel grass	-	-	-	-	-	-	-	-
Chromolaena odorata	Siam weed	High	High	High	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention
Cryptostegia grandiflora	Rubber vine	Medium	High	Medium	Prevention and Early Intervention, Containment B	Prevention and Early Intervention, Containment B	Prevention and Early Intervention, Containment B	Prevention and Early Intervention, Containment B, Containment A	Prevention and Early Intervention, Containment B, Containment A
Cryptostegia madagascariensis	Ornamental rubber vine	-	High	-	-	-	-	-	-
Cylindropuntia fulgida	Coral cactus	-	-	-	-	-	-	-	-
ylindropuntia fulgida var. mamillata	Prickly pear	Y	Medium	Medium	-	-	-	-	Prevention and Early Intervention, Containment A
Cyperus brevifolius	Mullumbimby couch	-	-	-	-	-	-	-	-
Eichhornia crassipes	Water hyacinth	Medium	-	Medium	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention

Species		Local Government/Council Priority							
Scientific Name	**Common Name**	**Burdekin Shire**	**Townsville**	**Charters Towers**	**Flinders**	**Richmond**	**McKinlay**	**Cloncurry**	**Mt Isa**
Harrisia martini	Harrisia cactus	-	High	Medium	Prevention and Early Intervention, Containment A	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention, Containment A	Prevention and Early Intervention, Containment B, Containment A
Hymenachne amplexicaulis	Hymenachne	Medium	High	Medium	Prevention and Early Intervention, Containment A	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention, Containment A	Prevention and Early Intervention, Containment B
Jatropha gossypiifolia	Bellyache bush	Medium	High	High	Prevention and Early Intervention, Containment A	Prevention and Early Intervention, Containment A	Prevention and Early Intervention	Prevention and Early Intervention, Containment A	Prevention and Early Intervention, Containment B, Containment A
Lantana camara	Lantana	Medium	High	High	Prevention and Early Intervention, Containment B	Prevention and Early Intervention, Containment A	Prevention and Early Intervention, Containment A	Prevention and Early Intervention, Containment A	Prevention and Early Intervention, Containment A
Lycium ferocissimum	African boxthorn	-	-	-	-	-	-	-	-
Opuntia monacantha	Dropping tree pear	Y	-	-	-	-	-	-	-
Opuntia stricta	Prickly pear	Y	Medium	Medium	-	-	-	-	Prevention and Early Intervention, Containment A
Opuntia tomentosa	Velvety tree pear	Y	-	-	-	-	-	-	-
Parkinsonia aculeata	Parkinsonia	Medium	High	High	Containment B, Containment A	Containment B, Containment A	Prevention and Early Intervention, Containment B, Containment A	Containment A	Containment A, Containment B
Parthenium hysterophorus	Parthenium weed	Y	High	Medium/ High	Prevention and Early Intervention, Containment A	Prevention and Early Intervention, Containment A	Prevention and Early Intervention, Containment A	Prevention and Early Intervention, Containment A	Prevention and Early Intervention
Prosopis pallida	Mesquite	Y	High	-	Prevention and Early Intervention, Containment A	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention

Species		Local Government/Council Priority							
Scientific Name	**Common Name**	**Burdekin Shire**	**Townsville**	**Charters Towers**	**Flinders**	**Richmond**	**McKinlay**	**Cloncurry**	**Mt Isa**
Salvinia molesta	Salvinia	Medium	High	-	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention, Containment A
Senna obtusifolia	Sicklepod	-	High	Low	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention, Containment A
Sphagneticola trilobata	Singapore daisy	-	Medium	Low	-	-	-	-	-
Sporobolus jacquemontii	America rat's tail grass	Medium	Medium	High	-	-	-	-	-
Sporobolus pyramidalis	Giant rat's tail grass	-	High	High	Prevention and Early Intervention, Containment B	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention	Prevention and Early Intervention
Tamarix aphylla	Athel pine	Y	High	Medium	Prevention and Early Intervention, Containment B, Containment A	Containment A	Prevention and Early Intervention, Containment B	Prevention and Early Intervention, Containment A	Prevention and Early Intervention, Containment B
Tecoma stans	Yellow bells	-	Low	Medium	-	-	-	-	Prevention and Early Intervention, Containment B
Thunbergia grandiflora	Thunbergia	-	High	Medium/High	-	-	-	Prevention and Early Intervention	Prevention and Early Intervention, Containment B
Vachellia nilotica	Prickly acacia	-	High	High	Asset Protection, Containment B, Containment A	Asset Protection, Containment B, Containment A	Asset Protection, Containment B,	Prevention and Early Intervention, Containment B, Containment A	Prevention and Early Intervention, Containment A
Ziziphus mauritiana	Chinee apple	Medium	High	High	Prevention and Early Intervention, Containment B, Containment A	Prevention and Early Intervention, Containment B, Containment A	Prevention and Early Intervention	Prevention and Early Intervention,	Prevention and Early Intervention, Containment A

5.2 Controls used to manage biosecurity

Biosecurity controls are planned before any relevant works commence. Biosecurity management objectives include:

- No introduction of new species
- No spreading of existing invasive species to neighbouring areas
- Identify and control all invasive plant and animal species listed under National, State or Local Government legislation and policies

5.2.1 Induction and training

All personnel in the field shall receive an induction regarding biosecurity matters and management requirements relevant to their specific work activities and construction zones. Training and awareness will include:

- Training sessions for personnel on invasive plant species identification, invasive plant management and reporting requirements for identified or suspected invasive plants
- A project-specific significant invasive flora and fauna identification guide, which shall be developed and be provided and promoted to all relevant Project personnel in general training and awareness sessions (e.g., pre-starts, toolboxes etc.)
- Training sessions on vehicle and machinery cleandown procedures required by the Queensland Government (Vehicle and machinery cleandown procedures, 2019).
- Personnel required to self-certify or certify vehicles, plant, equipment, and machinery as being weed free (biosecurity declaration) shall hold and maintain the national competency (AHCBIO201) Inspect and clean machinery for plant, animals, and soil material (or equivalent) and follow appropriate procedures (i.e., Vehicle and Machinery Inspection Procedure (DAFF 2013)). Competency and training records shall be maintained for no less than seven years.

5.2.2 Arrival of goods in Australia

Cargo arriving in Australia will need to be cleared by DAFF using declarations and information provided by the importer. Sea containers and breakbulk cargo from countries identified as having documented high levels of contamination, or high-risk pests, are considered as high-risk pathways. Imported goods may contain types of contaminants found on surfaces of sea containers including:

- **Insects** – can lodge themselves or build nests on shipping containers including ants, wasps, bees, beetles, moths, and spiders
- **Snails** – exotic snails such as the giant African snail
- **Animals** – such as rodents, geckos and toads are the main vertebrates found in and on shipping containers
- **Animal matter** – includes animal faeces, bones, skin, and hair
- **Plants** – plants can grow on shipping containers if residual seed has been allowed to germinate with or without contaminating soil, other plant matter includes leaves and other plant parts
- **Soil** – soil and soil related contaminants
- **Fungi** – damp, dark conditions may support fungi and other airborne spores can lodge and grow on any soil or container surface

DAFF also provides joint government industry initiatives such as the Sea Container Hygiene System (SCHS). The SCHS provides a high level of confidence that containers shipped from certain facilities and load ports will arrive in Australia free from biosecurity risk concerns.

If cargo comes from countries identified as having high levels of contamination it is referred to as Country Action List (CAL) locations. Due to the increased risk, CAL cargo is subjected to heightened biosecurity measures on arrival, including mandatory six-sided inspections of internal and external surfaces prior to release. All containers that arrive from a CAL country will require a six-sided inspection before being released.

5.2.3 Biosecurity controls and mitigation measures

Table 9 Satisfactory clean down criteria

Element	Performance Criteria
Check vehicles, plant, equipment, and machinery	• Vehicles, plant, equipment, and machinery to be checked for contamination according to written guidelines and legislative requirements • Vehicles, plant, equipment, and machinery are made safe for checking, supported safely, with free moving parts pinned or supported as required • Covers and guards removed safely • All points identified in legislation or operating procedures are identified and inspected for contamination
Clean vehicles, plant, equipment, and machinery	• Vehicles, plant, equipment, and machinery is made safe for cleaning, supported safely, with free moving parts pinned or supported as required • Correct equipment for cleaning selected • Points listed in appropriate regulations, checklists or enterprise procedures are cleaned • Areas on other equipment likely to accumulate contaminants identified, inspected, and cleaned.
Recheck vehicles, plant, equipment, and machinery	• Points listed in appropriate regulations, checklists or enterprise procedures are rechecked. • Guards replaced safely and checked
Complete cleaning work	• Waste materials are disposed of according to enterprise operating procedures and relevant legislative requirements • Records of cleaning are recorded on appropriate forms according to enterprise policy and procedures

Table 10 Biosecurity controls

Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
Pre-construction		
The presence, extent and characteristics of invasive flora and fauna will be determined (to inform the BMP) within 6 months of the commencement of construction, allowing sufficient time for weed management.	The JV Environment Manager	Legislative requirements UGLMS-131-544 UGLMS-131-391
Prior to construction, weeds will be treated in accordance with this plan, subject to land access requirements and seasonality constraints. Note, weed management may require access 2-3 months in advance of works to ensure any chemical treatment has time to take effect and that during clearing no live weed material is encountered. Treatment records will be maintained. Treatment will be undertaken, if using chemicals, with a person suitably licensed to do so.	The JV Construction Manager	BMP UGLMS-131-544 UGLMS-131-391 UGLMS-4-1321
All plant and equipment on the site will be washed down prior to arriving on site, with a declaration stipulating that the plant and equipment is clean by a certified person.	The JV Logistics Manager	
Construction		
All plant and equipment on site will be washed down at designated washdown bays when moving between properties, clean and dirty zones on a single property and	The JV Supervisor	Legislative requirements UGLMS-131-544

Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
prior to leaving site (if entering a new property or at the accommodation hub wheel wash). Once the topsoil has been stripped from an access track, this is considered a clean zone for vehicle movement (subject to no movement off-track) except where a designated washdown bay has been installed for use and is required to be used by the landholder under agreement/LAP requirement. Following washdown the plant / equipment will be issued with a declaration stipulating that the plant and equipment is clean by a certified person.		UGLMS-131-391 Landholder agreements LAPs
All persons with the national competency AHCBIO201 (or equivalent) for hygiene requirements for plant and equipment will be allocated a dedicated (unique identifier) Biosecurity Hygiene Book for their own use. Triplicate copies (with unique identifier and number within) will be used by the Project as follows: • Part 1 to be kept with the vehicle, plant or equipment at all times (and must be made available on request) • Part 2 copy to be left at the landholder specific washdown bay/property access box/provided to the relevant Land Agent • Final copy will be retained in the book and the book returned once used. A Weed Hygiene and Materials Register will include a book tracking system to track distributed books for their return for retained records.	The JV Environmental Manager	UGLMS-4-1322 UGLMS-4-1323
Weed hygiene management measures on site may require 'dirty' plant (working in a weed management zone) to be washed before movement within the road corridor / cross property boundary. These requirements will be mapped and displayed in prominent areas, together with targeted and whole of Project requirements. At each of these washdown locations, a temporary washdown bay will be installed and maintained, with records kept of washdown. Where temporary washdown treatment areas are established, care will be taken to ensure that they are located greater than 30m from a watercourse, drainage line or environmentally sensitive area; designed to contain weed seeds, sediments and to prevent vehicle recontamination.	The JV Superintendent	Appendix C
Wherever possible, topsoil will be re-used for rehabilitation in the area it was sourced from to reduce the spread / dispersion of weeds to other areas. During the construction period, topsoil stockpiles will be managed for weed regeneration in order to deplete the existing weed seedbank where feasible.	The JV Supervisor EA	BMP
Prior to clearing , a pre-clearance verification survey will be completed as part of the rapid fauna survey. Where an infestation has been identified (as part of the rapid fauna survey or ongoing targeted weed surveys and post wet season), the area will be excluded until appropriate treatment has occurred in accordance with the project's biosecurity plan requirements specific to that weed and risk-based nature of the works.	The JV Supervisor	BMP
When accessing construction sites, the JV and subcontractors will use only approved access tracks/roads.	The JV Supervisor	Land Access requirements
Ongoing spot/area weed treatment using chemicals will be by individuals who are sufficiently trained in the use of such chemicals (i.e. ACDC Licence). Records of all chemical treatments will be maintained. Notification of use of chemicals with Stakeholders will be in accordance with the Land Access Protocol.	The JV Supervisor/EA	UGLMS-131-544 UGLMS-131-391 UGLMS-4-1321 Land Access Protocol
All high-risk materials, including soils or mulch, brought to the project site must have a biodiversity declaration (including documentation) from the supplier confirming they are weed-free.	The JV Supervisor	HSE Specification

Mitigation Measure	Responsibility	Reference Documents (Where Applicable)
A project specific significant biosecurity identification guide will be developed and be provided to project personal and promoted as required at toolbox/prestart meetings. All personnel will maintain a copy of this guide in their transport.	The JV Supervisor/EA	CopperString 2032 EIS
Clean down facility material that contains contaminated biosecurity matter shall be disposed of as regulated waste.	The JV Supervisor/ PM/EA	CopperString 2032 EIS
At a minimum, vehicles will be subject to a clean down every six weeks regardless of vehicle movements across the project. This is only applicable for light vehicles, crew trucks, service vehicles, transport trucks and any other vehicle which regularly traverse between different project weed zones.	All project drivers	CopperString 2032 EIS
Topsoil contaminated with biosecurity matter or large stockpiles of biosecurity matter will be stored separate to clean topsoil/vegetation piles and clearly signed to avoid mixing with clean areas.	The JV Supervisor	CopperString 2032 EIS
Where required, vermin and pest control will take place around accommodation and camps.	The JV PM	CopperString 2032 EIS
Temporary clean down facilities (washdown bay/wheel wash as otherwise known) will meet the following design criteria: • Where clean downs are required to be completed at one-off locations, the site will: ○ Be selected at the edge, or nearby to any areas where weeds or pathogens need to be contained ○ Be selected in consultation with/agreement from the landholder ○ Ensure runoff will not enter any watercourse or waterbody ○ Avoid sensitive vegetation ○ Be selected in mud free locations which gently drain away from the clean down location • For temporary mobile wash facilities on easement these must be a bunded area with treated discharge system, gurney operated with generator power and be manned to maintain cleanliness and pump out as required • For temporary wash facilities within accommodation hubs these will be designed with a 5-year design life and will involve, or meet an equivalent design outcome of: ○ Bunding and side/enclosed walls to prevent overspray ○ Balance tank and recycled water tank as a closed system ○ Collection sump with float operated pump to avoid overflows ○ Silt sump for capture of waste and collection ○ Sand filter for treatment of wastewater to recycle ○ Vertical gravity separator with waste container and sludge tank accessible for collection and clean outs ○ Contingency power supply.	The JV PM	Best practice
Temporary clean down facilities will be decommissioned at the end of the project/when not required and area progressively rehabilitated.	The JV PM	CopperString 2032 EIS

Table 11 Biosecurity measures

Item	Aspect	Control Detail	Area of Concern	Timing	Performance Criteria
1	Training and competency	All personnel will undertake the site environmental induction which will include detailed project biosecurity requirements.	Entire project	Prior to mobilisation	100% of site personnel deemed competent in biosecurity management
		Properties categorized as being high risk and having exceptional biosecurity requirements and as identified by the Environmental Manager (i.e., organic properties, specific/3rd party washdown requirements, detailed landholder biosecurity requirements) will have project specific biosecurity inductions delivered to all persons accessing that property.	Properties identified by the Environmental Manager	Project lifecycle	High risk properties have property specific biosecurity induction developed and delivered
		Targeted biosecurity toolboxes, training, education campaigns and notices will be developed and implemented. This includes seasonal weed awareness programs, biosecurity identification tools biosecurity notice boards.	Entire project	Throughout project focussing on high-risk periods	Targeted biosecurity campaign at least monthly Biosecurity identification tools provided with each work pack
		All personnel that are required to inspect and issue clean down certificates will hold and maintain the national competency (AHCBIO201) Inspect and clean machinery for plant, animals, and soil material (or equivalent). A register of all project personnel with the competency will be developed and maintained.	VPE clean downs	Prior to issuing clean down certificates.	All manager, supervisors, engineers, HSE roles and subcontractors to obtain AHCBIO201 Develop and maintain competent persons register
		The use of herbicide will only be carried out by persons holding a current Agricultural Chemical Distributions Control Licence (ACDC License).	Herbicide use	Prior to use of herbicide.	All contractors undertaking weed control hold ACDC license
2	Pre-construction, during and post construction weed surveys and treatment.	Prior to commencement of construction, invasive, declared and pest flora/fauna surveys will be carried out within the project footprint and all ancillary facility locations (camps, laydown, staging areas etc). Results of the surveys will be provided to the JV.	Entire project	Prior to commencement of construction.	All pre-construction surveys carried out and results provided to the JV prior to construction activities
		Invasive, declared and pest flora/fauna surveys will occur following the first wet season after construction across the project construction area and ancillary facilities.	Entire project	The first wet season at the completion of construction	Carry out surveys following the first wet season after construction
		All invasive, declared or pest species identified during all surveys will be treated and declared not viable.	Entire Project	Prior to commencement of construction	Zero invasive, declared or pest species present during

Item	Aspect	Control Detail	Area of Concern	Timing	Performance Criteria
					construction. Any species that are still present will not be viable
		All invasive, declared or pest species identified and treated during pre-construction and post wet season surveys will be mapped with mapping made available on the project GIS. All treated species will also be mapped. Details to be recorded include: • Person who recorded/treated weed. • Date and time of finding and treatment. • Method of treatment • Required follow treatment/surveys of identified weed.	Entire project	Following pre- construction surveys and treatment	Outcome of surveys and treatment uploaded onto project GIS
		Records are to be made for each ground distribution of herbicides in accordance with section 26 of the *Agricultural Distribution Control Act 1966.*	Treated flora and fauna	Following pre- construction surveys and treatment	Details of 100% of all herbicide applications to be recorded
		During construction, weekly biosecurity surveys will take place targeting: • New incidence of weeds • Weeds that are flowering • Weeds that are fruiting and setting seeds. Any findings of the above will be reported and recorded as per this plan.	Entire project	Project lifecycle	Undertake weekly biosecurity surveys and record findings Undertake treatment of any findings
		All suspected or confirmed new weed outbreaks will be reported to the client and the landowner. Where the weed is of local significance the local council will also be informed.	Entire project	Project lifecycle and post construction	All new weed outbreaks reported appropriately
		All construction surface water sources will be subject to a weekly biosecurity inspection while the water source is in use.	Project surface water sources	Project lifecycle	
3	Vehicle, plant, and equipment management.	Prior to arriving on site, all VPE must: • Be cleaned down • Be accompanied with a washdown certificate issued by a person with the competency AHCBIO201 • Be approved for use on site by the JV prior mobilisation.	Vehicles, plant, and equipment	Prior to arriving on site	100% of VPE arriving onsite will be cleaned with a clean down certificate and approved for entry to site

Item	Aspect	Control Detail	Area of Concern	Timing	Performance Criteria
		Any VPE that leave the project must have the above prior to coming back on the project. All returning VPE will be treated as a new VPE regardless of the length of time away from the project or where it is returning from.			
		A project VPE inventory will be kept and updated weekly. The Inventory details will include: • Asset point of origin • Asset arrival date • Asset details (type, identification, owner) • Asset clean-down history • When the asset demobilised from the project.	Vehicles, plant, and equipment	Project lifecycle	Develop and maintain project VPE inventory
		All VPE will be cleaned down prior to moving between biosecurity zones or within the project. All clean downs will be undertaken at an approved clean down location. Approval must be given prior to construction of new clean down facilities or undertaking clean downs at any other location.	Vehicles, plant, and equipment	Project lifecycle	All VPE to be cleaned down in accordance with Table 9 Zero project movements without correct clean downs Clean downs only at approved locations
		At a minimum, vehicles, plant, and equipment will be subject to a clean down every six weeks regardless of vehicle movements across the project. This is only applicable for light vehicles, crew trucks, service vehicles, transport trucks and any other vehicle which regularly traverse between different project weed zones.	Vehicles, plant, and equipment	Project lifecycle	All required VPE are cleaned down at a minimum of every 6 weeks
		Vehicles, plant and equipment should always be kept in a tidy and clean state. Following rainfall, any VPE that has excess mud caked to it or high risk of storing seeds should be cleaned down as soon as possible once conditions have dried.	Vehicles, plant, and equipment	Following rainfall	
		All persons trained in AHCBIO201 (or equivalent) will be allocated a dedicated (unique identifier) Biosecurity Hygiene Books for their own use. Triplicate copies (with unique identifier and number within) will be used by the Project as follows: • Part 1 to be kept with the vehicle, plant, or equipment always (and must be made available on request)	Vehicles, plant, and equipment	Project lifecycle	All trained personnel to always carry and correctly manage biosecurity hygiene books Zero unauthorised issuing of biosecurity certificates

Item	Aspect	Control Detail	Area of Concern	Timing	Performance Criteria
		• Part 2 copy to be left at the landholder specific washdown bay/property access box/provided to the relevant Land Agent • Final copy will be retained in the book and the book returned once used.			
		Vehicle, plant, equipment, machinery and personnel must be disinfected when exiting a known pathogen risk area. Actions must be recorded on a 'biosecurity matter free' declaration form.	Construction Equipment	Project lifecycle	Zero spread of biosecurity matter from movement of equipment
		Construction crews must ensure clothing, hand tools, spray equipment etc. are free of weed, plant and animal material at the end of each day or when moving between different properties.	Construction Equipment	Project lifecycle	Zero spread of biosecurity matter from movement of equipment
		In any instances where project VPE work outside the approved or designated project area, the area located will be recorded and monitored for future weed outbreaks and an incident logged into the IMS. Any new occurrences of weeds in the off-easement area that was accessed will be treated as per the weed consultant's advice.	Vehicles, plant, and equipment	Off project areas	Access to unauthorised areas to be recorded and monitored
		At minimum, a biosecurity compliance audit will be carried out 6 monthly. The Audit will: • Inspect weed clean down certificates to ensure they have been issued within the last 6 weeks at minimum • Inspect weed clean down certificates to ensure they are issued by a suitably qualified person • Inspect weed clean down certificates to ensure the assess they are issued to are in the correct biosecurity zone • Inspect VPE immediately after being issued a weed clean down certificate to ensure the asset has been appropriately cleaned down.	Vehicles, plant, and equipment	At least 6 monthly	Undertake biosecurity audit at least 6 monthly
		Copies of all biosecurity declarations will be reported to the client land liaison team for communication to landholders no later than once month from issue.	Vehicles, plant, equipment, and materials.	At least monthly	Copies of all biosecurity declarations provided to the client
4	Project material management	All sea containers arriving from a CAL will undergo six-sided inspections prior to transport of materials to site.	Materials	Project lifecycle	All materials that are transported through the port of Townsville will

Item	Aspect	Control Detail	Area of Concern	Timing	Performance Criteria
					be released as compliant with biosecurity measures
		All high-risk materials, including soils or mulch, brought to the project site must have a biodiversity declaration (including documentation) from the supplier confirming they are weed-free.	Soil, mulch, and material	Project lifecycle	All material brought onto the project is certified as weed free
		Topsoil contaminated with biosecurity matter or large stockpiles of biosecurity matter will be stored separate to clean topsoil/vegetation piles and clearly signed to avoid mixing with clean areas. GPS coordinates of stored contaminated material will be recorded onto the project GIS.	Soil, mulch, and material	Project lifecycle	All contaminated stockpiles will be stored separately and appropriately signed and recorded
		To avoid the possible spread of material containing biosecurity matter, all loads transporting material must be covered.	Soil, mulch, and material	Project lifecycle	All loads entering site will be covered
		Topsoil will be appropriately managed to maintain the native seed bank and reduce occurrence of weed infestations by: • Ensuring topsoil windrows and stockpiles are not traversed over • Treat outbreaks of weeds on topsoil stockpiles and windrows • Weekly inspections of topsoil stockpile to identify any weed outbreaks.	Soil, mulch, and material	Project lifecycle	Outbreaks on topsoil stockpiles will be treated and no vehicles will drive over topsoil stockpiles or windrows
		Topsoil or mulch will not be transported across property boundaries without prior approval from the landholder.	Soil, mulch, and material	Project lifecycle	Topsoil respread on existing property unless otherwise approved
5	Clean down facility management	Clean down facility material that contains contaminated biosecurity matter shall be disposed of as regulated waste.	Clean down facilities	Project lifecycle	Biosecurity matter will be appropriately disposed of
		Runoff from clean down facilities will be managed to ensure sediment, grease, oil, and viable plant material does not contaminate adjacent land or waterways.	Clean down facilities	Project lifecycle	Runoff from project washdown facilities will managed
		All clean down facilities will have a register documenting detail of each use. Details should include. • Persons using the facility. • Any potential biosecurity matter being cleaned. • Details of VPE being cleaned.	Clean down facilities	Project lifecycle	Develop and maintain a clean down facility register

Item	Aspect	Control Detail	Area of Concern	Timing	Performance Criteria
		All temporary washdown facilities will be decommissioned and the site suitably rehabilitated. The GPS coordinates of each washdown location must be taken and recorded with the site monitored for future weed outbreaks.	Clean down facilities	Project lifecycle	Decommission all temporary washdown facilities and record their location for monitoring purposes
		Clean down equipment will be maintained in a serviceable and usable condition as per the manufacture's specifications and operating procedures. Clean down pads will be cleaned immediately after each use, prior to the next asset using the facility.	Clean down facilities	Project lifecycle	Clean down equipment and pads will always be kept in a serviceable and clean condition
6	Landholder considerations	Individual landholder property biosecurity management requirements will be implemented where they have been identified. Each property and landowner have been requested to provide the following: • Notable biosecurity matter of concern. • Location, volume, and origin of biosecurity matter of concern • Pre, during and post construction treatment requirements for noted biosecurity matter. • Entry and exit clean down and notification requirements. • Reporting requirements for biosecurity matter identified on the landholder property. • Date concern was raised. These requirements will form part of the contractual land access agreement for the property and be included in following project material: • Work packs Land access permits. Movement control plans shall also be developed.	Entire project	Project lifecycle	Each landholder and land parcel will have their biosecurity requirements detailed and included in relevant project documents
		Each property boundary and access point will be signed with the following details: • Individual property identification • Biosecurity zone property is located within.	Entire project	Project lifecycle	Property boundaries and access points will have appropriate biosecurity signage

Item	Aspect	Control Detail	Area of Concern	Timing	Performance Criteria
		• Reminder that all persons must have a valid clean down certificate prior to entering • When moving between biosecurity zones a notice reading "*STOP! You are entering a new biosecurity zone. Refer to Biosecurity cheat sheet for entry requirements*".			
7	General	All persons entering the construction area are required to declare they have not been to a foot and mouth declared country in the past 7 days. Any persons returning from, and Foot and Mouth declared country are subject to the biosecurity determination as per the *Biosecurity Act 2015.*	Entire project	Period of biosecurity determination	No project personnel enter site after being in Foot and Mouth country within 7 days
		The project will maintain a pest and vermin interaction register. The register will detail: • Species of pest animal sighted • Location of sightings • Biosecurity matter class of sighted pest.	Entire project	Project lifecycle	Develop and maintain project pest and vermin register
		The project will ensure food scraps and any animal attracting waste are appropriately stored and disposed of. Waste containers will be emptied from the worksite regularly to prevent vermin and pest infestations, overflows and to minimise odours emanating from such areas.	Entire project	Project lifecycle	Zero food waste or waste that can attract pests to be left onsite All food waste appropriately disposed of at accommodation facilities
		Where a net increase in the occurrence of pest animals is observed across the project because of project activities OR new pest animals are identified within the project footprint due to project activities, a pest animal reduction plan will be developed and implemented. The pest animal reduction plan will include: • Pest species to be targeted • Methodology proposed to be used for pest animal reduction activities • Target reduction of pest animals (number of individuals to be removed) • Locations pest animal reduction will occur • Post reduction monitoring program.	Entire project	During construction activities	Zero increase in occurrences of pest animals and zero new pest animal species identified

Item	Aspect	Control Detail	Area of Concern	Timing	Performance Criteria
		Where pests and vermin are observed around camp accommodation and ancillary infrastructure settings, the camp contractor will undertake pest and vermin management.	Accommodation and ancillary infrastructure facilities	During operation of accommodation camps and ancillary facilities	Undertake pest control around camps and facilities as required
		Vehicle journey planning will be undertaken to • Visit biosecurity free areas first, as far as practicable, before travelling to areas affected by biosecurity matters • Avoid or minimise travel through areas heavily affected by biosecurity matters wherever possible • Use established roads and tracks where practicable, with slashing and gravelling to be considered in areas of high-volume traffic.	Entire project	Project lifecycle	Vehicle journey planning undertaken
		Ground disturbance and clearing will be kept to a minimum, however where clearing and access operations are required, a grader will go ahead of work crews where possible, removing and windrowing topsoil to forming a temporary suitable access track and turn around area. Light vehicles and service trucks will utilise the access tracks and turn around area, reducing the need to traverse over vegetation and reducing contact with biosecurity matter.	Clearing and access front	During clearing and access	Provide an access track (with topsoil removed) at the earliest possible point during clearing operations
		During reinstatement, where possible, an access track will remain in place to all tower pads and facilities to reduce the need to traverse reinstated areas and reducing contact with biosecurity matter. Where possible, reinstatement will take place from areas where no further works are required first. All effort will be taken to ensure reinstatement in not traversed through.	Entire project	Project lifecycle	For as long as possible, maintain an access track (with topsoil removed) to all areas of the project
		Reinstated areas will be clearly defined and signed. Where an area has been reinstated but an access track still exists the following signage will be used: *Reinstatement complete. Access only via permanent access track.*	Reinstated areas	During and post reinstatement	Clearly demarcate areas that have been reinstated from areas which can still be accessed
		To reduce the risk of transferring aquatic biosecurity matter across the project, the following will occur:	Surface water bodies	Project lifecycle	No spread of aquatic biosecurity matter

Item	Aspect	Control Detail	Area of Concern	Timing	Performance Criteria
		• Screening filters will be placed on all pump suction inlets when taking water from surface water sources • Surface water will not be released directly into or be allowed to runoff into different bodies of surface water (different to the origin).			Screening on all surface water pump inlets

		Work packs will be provided to all work crews. Biosecurity information in each work pack will include:
		• Clean down requirements required for each biosecurity zone for each construction phase:
		  ○ Location of each biosecurity zone
		  ○ Location of approved clean down facilities
		• Biosecurity matter Identification tool
		• New pest animal/weed observation form.
			Entire project	Project lifecycle	Work packs to contain biosecurity information

		A biosecurity cheat sheet will be developed and kept with every Vehicle, Plant, and equipment. The cheat sheet will be a quick reference guide for all project persons (Appendix B) The information provided on the cheat sheet will be: • Key environmental contact for assistance • Each biosecurity zone location • Requirements to enter each zone.	Entire project	Project lifecycle	Develop and ensure each vehicle has project biosecurity cheat sheet
		Participate in any Queensland Government biosecurity directives for managing emergency situations as directed by Powerlink Queensland.	Entire project	Project lifecycle	Participate as directed in managing emergency situations

5.2.4 Clean down types

Different biosecurity zones and construction stages may have different clean down type requirements, ensuring each clean down is fit for purpose and appropriately manages the project biosecurity risk. There are four types of vehicle clean downs that are endorsed by this management plan, they are detailed in the below table.

Table 12 Clean down types

Clean Down Type	Definition
Individual clean down declaration (self-certify)	Trained person can complete wash down and also declare vehicle as clean if they are certified.
2nd Party Clean down Certification (Independent Person)	Trained person can complete wash down. The wash down will be inspected by a certified person who did not perform the washdown. The washdown certificate will have the certified person validate the Certificate.
Third Party Clean down Certification (Independent Company/ Operator)	Conducted by an independent company / operator competent to complete biosecurity clean downs and provides a certification that the vehicle/ machinery is clean.
Field Clean Downs	Trained person can complete clean down in the field. Field clean down should include compressed air and vacuum or broom, as a minimum.

5.2.5 Landholder requirements

To facilitate compliance a Land Access Protocol is used to inform landholders and stakeholders about the standards and commitments the client, contractor and their respective representatives will adhere to when accessing properties to conduct construction activities. The Land Access Protocol was created in response to the client's consultation with landholders. This document supports open and transparent communication and understanding between the client, contractor, and landholders. Specific landholder requirements are outlined in the relevant Land Access Permit. Landholder requirements may include:

- Notice of access
- Registration numbers of every vehicle entering the property
- Location of proposed activities
- Proposed time and period of entry to the property
- Name and employer of each person accessing the property
- No burning or lighting of fires
- No planting of trees
- No clearing of vegetation, except if necessary to the activity.

5.3 Monitoring biosecurity

Monitoring biosecurity is to be performed in compliance with legal and contractual requirements. Where monitoring determines a non-conformance has occurred, a non-conformance report and/or incident report will be created, and corrective actions will be determined. Monitoring is to be carried out by a competent person who has undertaken training and evidence of the training will be retained. It is the responsibility of the Project Environmental Representative (or delegate) to ensure all monitoring is performed according to these requirements.

Post rehabilitation monitoring will be undertaken in accordance with the CEMP and Rehabilitation plan. Suspected weed outbreaks will be reported, and coordinates of their locations will be reported to the contractor HSE representative who will investigate and action as appropriate. Site inspections will be undertaken by contactor personnel and shall incorporate biosecurity aspects as required under this management plan.

6. Reporting

Weekly inspections will be carried out and weekly reports on findings are to be developed and reported. Any presence of restricted matter will be reported to the Regulator. If there are findings of an increasing intensity and spread of weeds this will be managed as an incident.

7. Plan Review and Control

This plan shall be reviewed on a regular basis but not greater than 12 monthly intervals in accordance with the requirements specified in the

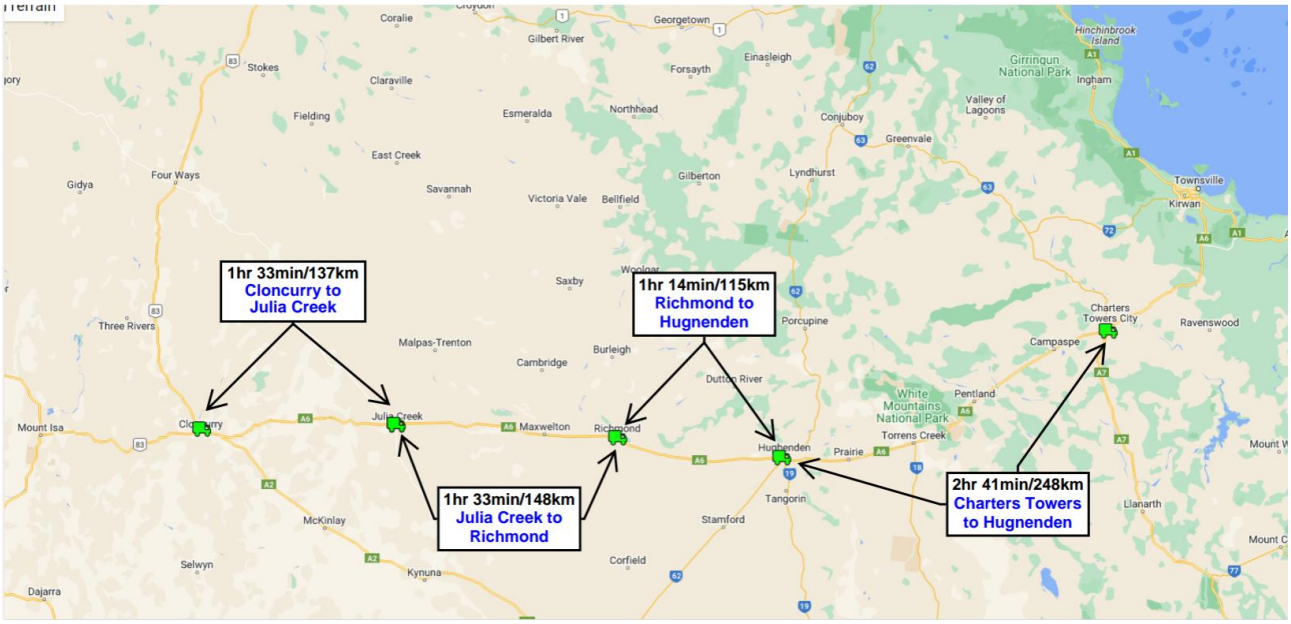
- JV Quality Management System requirements
- CEMP Review
- CopperString2032, Powerlink – HSE Specification for Contractors and Suppliers.

All the Project environmental management documents, review (version history) will be uploaded and maintained on In Eight or JV's Document Management Systems.

All environmental management reviews will be recorded on a dedicated assurance Register. JV triggers that will be used for initiating an environmental management review will include:

- Repeat notifiable incidents
- Environmental KPIs consistently not being met having consideration to contributing factors.

Appendix A Washdown Bay Locations (existing)



Appendix B Clean Down Procedures

Vehicle and machinery cleandown procedures



Queensland Government

This publication was compiled by Biosecurity Queensland, part of the Department of Agriculture and Fisheries.

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1 General information

An invasive plant is a plant species that has or is likely to have an adverse impact on a biosecurity consideration because of the introduction, spread or increase in population size of the species in an area.

Invasive plants cost Queensland more than $600 million annually in lost production, land degradation and control costs. The spread of invasive plants threatens our agricultural industries, environment and social amenity.

Invasive plant infestations in Queensland have resulted of poor vehicle and machinery cleanliness and maintenance.

Vehicles or machinery operating or moving through weed infestations can become contaminated with invasive plant seeds or other reproductive material. These seeds or reproductive material can then travel long distances on the vehicle or machinery to new locations.

Reproductive material can include any part of a plant that is capable of growing to become a new plant (e.g. a bulb, rhizome, a stolon, a tuber, a stem, leaf cuttings or stem or root fragments).

There is a real risk that these seeds or soil and mud containing the seeds will fall from contaminated or dirty machinery or vehicles in agricultural production or environmentally sensitive locations where an invasive plant infestation may become a long-term and costly problem for the land manager to remediate.

Clean down of vehicles and machinery reduces the risk of spreading invasive plants and soil borne pests and diseases.

These clean-down procedures have been developed to allow a consistent approach across Queensland to the cleaning of vehicles and machinery. These methods will help reduce the chance of spreading invasive plant seeds or other reproductive material when moving vehicles or machinery.

This document will also help those undertaking the cleaning and inspection of vehicles and machinery to understand their role in helping drivers and operators to discharge their obligations.

1.1 General Biosecurity Obligation

Under Queensland's *Biosecurity Act 2014*, all persons have an obligation to take reasonable and practical measures to prevent or minimise the biosecurity risks associated with their activities or dealings with the carriers of invasive plants.

A carrier is anything capable of moving biosecurity matter, such as invasive plant seeds, attached to, or contained in the thing from one place to another.

All types of vehicles and machinery are capable of being carriers of invasive plants.

A person (for example, the owners or operators of vehicles and machinery) may show that they have discharged their general biosecurity obligation by following these procedures to ensure that

their vehicles and machinery are as clean as practical of the seeds or other reproductive material of invasive plants.

A person may rely on another person to take the measures on their behalf, if the measures are undertaken with due diligence.

1.2 Mineral Resources Acts - Land Access Code

Under the Land Access Code, a resource authority holder must (if asked) provide a landholder with a copy of the clean-down record. There is no set format for a clean down record. In providing that record, a person may refer to this document to describe the measures taken to perform the clean down.

1.3 Training

All people responsible for cleaning down vehicles or machinery should have previously undertaken competency-based training and received a satisfactory assessment.

Competency-based training is provided by registered training organisations (RTO) through units such as AHCBIO201A—Inspect and clean machinery of plant, animal and soil material. After completing this training, a person will be able to perform the tasks outlined in Table 1.

Table 1. Competencies required for satisfactory clean-downs

Element	Performance criteria
Check machinery and support vehicles	1.1. Machinery and equipment are checked for contamination according to written guidelines and legislative requirements. 1.2. Machinery and support vehicles are made safe for checking, supported safely, with free moving parts pinned or supported as required. 1.3. Covers and guards removed safely. 1.4. All points identified in legislation or operating procedures are identified and inspected for contamination.
Clean machinery and equipment	2.1. Machinery is made safe for cleaning, supported safely, with free moving parts pinned or supported as required. 2.2. Correct equipment for cleaning selected. 2.3. Points listed in appropriate regulations, checklists or enterprise procedures are cleaned and checked. 2.4. Guards replaced safely and checked. 2.5. Areas on other equipment likely to accumulate contaminants identified, inspected and cleaned
Complete cleaning work	3.1. Waste materials are disposed of according to enterprise operating procedures and relevant legislative requirements. 3.2. Records of cleaning are recorded on appropriate forms according to enterprise policy and procedures

1.4 Possible sources of invasive plant contamination

- Heavy machinery (e.g. dozers, excavators, graders) may contain seeds in mud on the tracks, tyres or attached implements.

- Farm vehicles that have been used in infested paddocks (e.g. tractors four-wheel drives) may be contaminated via mud on the wheels, seeds trapped in radiators or seeds in cabin floor mats.

- Farm Implements such as slashers, ploughs, mulchers and post-hole diggers may be contaminated after being used in infested paddocks.

- Harvesting machinery and headers may collect weed seeds in augers, in bins and behind guards when harvesting crops that are infested with invasive plants.

- Wheeled loaders and other mining and construction equipment may contain contaminated mud.

- Cars, trucks and four-wheel drives that have driven off-road through weed infestations may catch weed seeds in the radiator, mud guards, tyres and underbody.

- Trucks that have transported livestock from infested areas may contain viable weed seeds (e.g. prickly acacia, giant rat's-tail grass) that have fallen from or been passed through stock

1.5 High-risk areas

Vehicles and machinery driven or operated in certain areas of Queensland have a higher risk of becoming contaminated with the reproductive material of invasive plants:

- Vehicles and machinery that have been used, driven or sourced from the Central Highlands are at greater risk of being contaminated with parthenium weed seeds.

- Coastal and subcoastal areas from the New South Wales border to Rockhampton, as well as areas near Moura, Mackay, Townsville, Ingham and Mareeba, contain current infestations of exotic giant rat's-tail grass.

To view distribution maps of all Queensland's invasive plants, visit daf.qld.gov.au. However, for detailed information, you should consult those who have specific local knowledge (e.g. landholders, local and state government officers).

1.6 Tips for reducing the risk of spread

- Avoid driving off-road in areas known to contain declared plants (e.g. giant rat's-tail grass, parthenium weed) or in other areas that present a risk of vehicle or machinery contamination.
- Do not drive through infested paddocks.
- Ensure clothing and footwear is free of soil and plant material before stepping into vehicles.
- Avoid driving or working in contaminated areas in wet or dewy conditions.
- Clean vehicles and machinery suspected of carrying soil or plant material.
- Begin work in clean areas or in areas with the least amount of infestation and work towards infested or high-density areas.
- Keep roads, laneways and buffer zones free of invasive plants.
- Where possible, work infested areas separately and clean down equipment thoroughly before moving to another area.
- Avoid slashing and other work in infested areas during peak seed production times.
- Secure loads (e.g. grain, fodder) if you suspect they contain weed seeds.

2 Clean-down and maintenance sites

2.1 Choosing a mobile or field clean-down site

Cleaning vehicles and machinery before moving them to a different area helps prevent the spread of invasive plants to adjoining land, other parts of the property and along roads. However, you should choose a clean-down site that will give the best possible results and should consult the landholder about its location.

- Consider the site's run-off. Ensure the site is away from watercourses and drains—this will help prevent the spread of invasive plants and will avoid grease and detergents polluting the water.
- Choose a relatively flat site to help prevent run-off and to ensure safety. However a slight slope or the use of railway sleepers may prevent waterlogging.
- Ensure the site can be easily identified, as it will need to be monitored for outbreaks in the following seasons, and notify the landholder/trustee of the land of this location.
- A painted post, distinguishing landmark or GPS recording will help identify the site
- If possible, choose a well-grassed area to reduce mud during cleaning. Also, grass will compete with any weed seeds that later germinate, limiting the spread of the weed.
- Choose a site close to the infested area to prevent further spread.
- Do not choose a site that lies across the property boundary (unless the infestation is also located on the adjoining property at similar or higher densities).
- If possible, conduct small clean-downs at the landholder's shed facilities (with permission) before leaving the property.

2.2 Public clean-down facilities

Throughout Queensland, clean-down facilities are available for public or industry use. They are provided for cleaning vehicles and machinery to prevent spread of invasive plants and should be used whenever possible, as they are equipped with grease and silt traps for environmental protection.

Some local governments have clean-down facilities (e.g. at saleyards or council depots) and some of these may be suitable for machinery and vehicles. You may need to seek permission before using these facilities. For further information or for permission to use these facilities, contact the relevant local government.

Some facilities contain high-pressure water and air compressors.

2.3 Choosing a maintenance site

- If possible, use a hard-surfaced area such as a gravel area beside the landholder's shed. Then work can be carried out easily, parts can be removed safely and the area can be monitored.
- If the maintenance work must be done in the field/paddock, mark the area for future monitoring and record its location. Remember that during maintenance, declared

plant reproductive material may fall off the machinery when guards etc. are removed, so monitoring is essential.

3 General clean-down procedures

3.1 Safety

Ensure all safety precautions are taken. Refer to the relevant sections of the operating manual of the vehicle or machinery for specific safety instructions before cleaning.

- Place the vehicle or machinery in a safe position. It should be stable and immobile.
- Stop the engine, apply the park brake, chock the wheels and lower all implements or secure/chock them if they need to be up for cleaning (e.g. the slasher).
- Ensure the area is free of obstructions and objects that may cause injury (e.g. logs, power lines).
- Have a qualified operator present if parts of the vehicle or machinery need to be moved during cleaning.
- Move the vehicle or machinery with caution.

3.2 General clean-down guidelines

The following points are general guidelines only. Please refer to the specific procedures later in this document for different types of vehicles and machinery.

- Examine the item to determine how much mud, soil and plant material has built up.
- Identify any areas that require special attention as outlined in the specific vehicle or machinery procedures (e.g. radiators, spare tyres, behind guards and protective plates). Some of these may be difficult to locate and access. Remove the necessary guards or belly plates to access these areas for cleaning.
- Identify any areas that must be cleaned with compressed air rather than water. Clean these first.
- Where possible clean from the top down
- Clean upper body and cabin then under the guards and underneath the machinery/vehicle and then do the attachments or implements.
- Clean all toolboxes and storage compartments.
- Check that all areas have been cleaned.
- Replace the guards. (Remember that belly plates and other guards on heavy machinery may need to be replaced before moving the machinery.)
- Move the clean vehicle or machinery carefully, avoiding recontamination. If necessary, wash any remaining mud, soil or plant material from the tyres or tracks.
- Record the details of the cleaning on the appropriate forms or in the vehicle or machinery logbook.
- Present the vehicle or machinery to an inspector if required.
- Dispose of any plant material according to the relevant guidelines.

Remember that no clean-down guidelines can detail all the parts to check. This is because there are:

- numerous different models and new models
- different attachments (e.g. different types of blades on dozers)
- different modifications, either in the factory or by previous owners

- varying conditions of the machinery (e.g. rusted parts allowing entry of contaminants into sections that are usually sealed).

Examine the item you are cleaning very carefully for any areas that could be contaminated, even if these areas are not listed in the guidelines, and clean them thoroughly.

3.3 Basic cleaning for all vehicle types[1]

CAUTION
DO NOT use high-pressure water jets in compartments that house electronic components.

The basic cleaning requirements for all vehicles are given in Table 2. It is best to start cleaning at the top of the vehicle and work down to the ground. Carry out the basic cleaning in conjunction with the specific requirements for the type of vehicle, ensuring that you remove all soil and plant material.

Table 2. Basic cleaning requirements for vehicles

Area	Actions
Air tanks	Clean these as for fuel tanks.
Air vents	Unscrew the air vents and blow them with compressed air. If filters are fitted, remove and clean them.
Battery	Remove the battery and clean underneath it.
Battery box	Clean the battery box.
Bodywork	Check all damaged bodywork. Remove any floor or body strips or moldings that form lips where soil or plant material may become trapped, particularly on vehicle floor compartments.
Bumper and brush guard	Clean all hollow sections and attachment points.
Canopy	Remove the canopy and brush it, then clean it with compressed air or high-pressure water.
Canopy bows	Disassemble the canopy bows, then wipe or scrub them with brushes and water. Pay particular attention to locking catches, joints and hollow cross members.
Chassis	Clean the chassis with high-pressure water using equipment with a flexible nozzle. Pay particular attention to small apertures, which may act as reservoirs for soil and plant material.
Dashboard	Use compressed air and dry paintbrushes to clean the dashboard.
Dual wheels	Take extra care cleaning vehicles fitted with dual bogie wheels. If contamination is detected, an inspector may ask for the outer wheel to be removed, cleaned and re-inspected.
Fender wells	Clean the access areas for tail-light wiring and other fender apertures that may collect soil and plant material.
Floor drain plugs	Remove all floor drain plugs to facilitate cleaning. Clean all drain plugs and apertures, paying particular attention to threaded areas.
Floor mats	Remove all floor mats or carpets and clean them.
Fuel tanks	If fuel tanks are strapped to the vehicle, clean them to remove contamination between the tank and the vehicle.

[1] Adapted from *Australian Defence Force military equipment & personnel: guidelines for offshore inspection*—see More Information, page 30.

Area	Actions
Insulation tape	Check all taped areas for contamination and replace the tape with new where necessary.
Interior	Remove all contamination with vacuum or compressed air equipment.
Internal panels, access panels	Where possible, remove all internal panels to allow cleaning of inner compartments.
Lights and reflectors	Remove all damaged lights (internal and external) and any lights where seals have not maintained their integrity, so that you can clean the light fittings.
Metal racks	Clean all box and tubular steel racks (which have openings) with high-pressure water.
Mirrors	Clean all mirror holders.
Radiator (all types)	Clean the radiator with compressed air and follow this with a low-pressure high-volume water wash. You may need to use brushes or to pick seed material from between the veins on the radiator.
Ropes, straps and Velcro	Check and clean all ropes and straps and items containing Velcro. Extend ropes and straps to their full length when cleaning and check all attachment points, fixtures and tension devices
Rubber seals	windscreens, doors, tailgates and other areas and clean or replace them as necessary.
Seatbelts	Clean and check all seatbelts, especially the catches where the seatbelts fasten. You may need to remove any sheaths or covers to adequately clean seatbelts.
Seat cushions	Clean the cushion covers.
Storage and tool compartments	Empty and clean all storage and tool compartments.
Support and cross members	Check and clean the transmission support members and other cross members.
Tools and equipment	Remove all items for cleaning. This may include jacks, wheel braces etc. Wipe tools clean
Toolboxes	Empty and clean all toolboxes. If they are bolted to the floor tray, unfasten and remove them to check there is no debris trapped between the floor and the toolboxes.
Tyres	Clean the tyres, paying particular attention to the tread and any cuts or gashes.
Winch cable drum	Unwind the winch cable and clean the drum, cable and any attachments of any soil and plant material that is embedded in the components or grease.

Remember: The key to successful cleaning is more than just ticking off a checklist
You should be thorough, systematic and consistent**.**
CHECK, CLEAN, RECHECK

3.4 Suggested equipment

- A mobile water tanker or spray unit (ideally) or water pumped from a dam or cattle trough or tank.
- A high-pressure water cleaner or pump.
- A garden hose (for small clean-downs).
- An air compressor (for removing dry material, e.g. from radiators and grain headers).
- Brooms, brushes and a dustpan (for cleaning cabins).
- A vacuum cleaner.

4 Specific cleaning checklists[2]

4.1 Cars, trucks and four-wheel drives

CAUTION
DO NOT use high-pressure water jets in compartments that house electronic components.

Complete the basic cleaning outlined in Table 2 and also check the following areas, cleaning as necessary.

Interior

- Check and clean the foot wells.
- Check the carpets and mats.
- Check and clean the seatbelts.

Boot

- Check and clean the carpet (checking for deposits of hay, weed seeds, burrs and/or soil).
- Check and clean the spare tyre area.
- Check and clean other recesses in the boot or rear of the vehicle.

Engine bay

- Check and clean the radiator.
- Check and clean the grill.
- Check and clean the top of the transmission gearbox.
- Check and clean the recess under the windscreen wipers.
- Check and clean the air filters.

Underside

- Check and clean the wheel arches, wheel trims, flares, step treads and bumpers.
- Check and clean the mudflaps.
- Check and clean the tyre rims (particularly the near side).
- Check and clean the axles and differentials.
- Check and clean the spare tyres on four-wheel drives and station wagons. These are often suspended underneath.

Note: These are high-risk areas, as contaminants collect inside the horizontally positioned rim.

Other areas

- Check and clean all toolboxes, ladders and storage compartments.
- Check and clean the back or tray of trucks and four-wheel drives.

Remember: The key to successful cleaning is more than just ticking off a checklist
You should be thorough, systematic and consistent**.**
CHECK, CLEAN, RECHECK

[2] Adapted from the Australian Department of Agriculture's machinery cleaning guides and checklists—see More information, page 30

4.2 Compactors[3]

CAUTION
DO NOT use high-pressure water jets in compartments that house electronic components.

Complete the basic cleaning outlined in Table 2 and also check the following areas, cleaning as necessary.

Cabin

- Remove any rubber floor mats and clean the floor surface.
- Remove and clean all door rubbers and internal door paneling.
- Clean all windowsills.
- Remove and clean under the seat, including the rubber seat shroud.
- Remove any non-affixed floor panels and clean underneath them.
- Remove the rubber pedal covers and clean them.
- Remove the cabin wall lining and clean behind it.
- Clean all air-conditioning vents, including the air-conditioning filter. You may have to remove paneling to do this.
- Remove the joystick control housing and clean inside it.
- Check the cabin roof, both inside and out.
- Remove any false floor under the cabin for cleaning.
- Clean the ladder to the cabin (which may have a hollow frame) and clean under each footstep.
- Remove all light covers and check the cavities behind them.
- If the cabin housing can be flushed via drainage holes, do so.

Engine bay

- Check all surfaces of the engine block, including between tappet covers.
- Remove and clean the air-filter pre-cleaner.
- Remove and clean the air-filter with compressed air.
- Clean inside the fan belt flywheels (harmonic balancer).
- Remove and clean any belly plates.
- Remove all non-affixed engine covers to allow access and clean all surfaces.
- Check the engine covers for any hollow support frameworks and flush these to ensure that they are clean.
- Remove all engine cover rubbers and clean them.
- Flush the hollow chassis rails either side of engine via drainage holes on the underside of the rails. You may need to remove the belly plate bolts to do this.
- Check the battery boxes either side of engine. Loosen the batteries and clean under them.
- Flush the radiator and oil cooler from both sides to ensure that the fin and core are clean.
- Loosen the radiator shroud to let loose debris fall through.
- Check either side of the radiator for vertical hollow support structures and flush them.
- Check inside all wiring harnesses.
- Check under all hydraulic looming.
- Remove zip-ties and electrical tape that hold hydraulic hoses together—this will facilitate cleaning.

[3] Adapted from the Australian Department of Agriculture's cleaning guide and checklist for compactors—see More information, page 30.

- Check all surfaces of the fuel cell (which generally sits below the radiator and the engine).

Wheel drums, boots and rims

- Check inside each cleat/boot on each wheel drum—generally these are only spot-welded or are hollow with access points.
- You may need to remove plates inside the wheel rims to access the brake drums. If so, remove them and clean them thoroughly.

Tyres

- Check each tyre for cracks or splits that can harbour seeds, soil or any other risk material.

Front end and bucket/blade

- Remove the front housing cover plate to allow better access to the hydraulics.
- Remove the cutting teeth from the bucket.
- Remove all non-affixed wear plates from the bucket.
- Check the front and back of the bucket for any cracks, splits or evidence of repair. If any are detected, the inside will need to be verified clean.
- Check any light mounts on the front wheel arches—these are generally hollow and require cleaning.
- Bucket push arms are generally sealed units, and check for hollow areas and drainage points.

Other areas

- Check all wheel arches for hollow support frameworks. You may have to loosen these from the chassis to clean where they join the arches.
- Clean all surfaces of the oil tank (which is generally near the ladder to the cabin).
- Clean and flush under all non-slip checker-plate surfaces.
- If the rear drawbar is hollow, remove the towing pin and flush the drawbar.
- Remove all contaminated grease on the machine, including around pivot points.

Remember: The key to successful cleaning is more than just ticking off a checklist
You should be thorough, systematic and consistent**.**
CHECK, CLEAN, RECHECK

4.3 Cotton pickers

CAUTION
DO NOT use high-pressure water jets in compartments that house electronic components.

Complete the basic cleaning outlined in Table 2 and also the following checks, cleaning as necessary.

Row units

- Examine the picking heads externally for cotton trash or soil and plant material.
- Open all picking head inspection doors to expose the moisture racks, doffers, spindle bars and rotor assemblies. Manually rotate and check and clean the rotor assemblies.
- Open the rear inspection doors on the air ducts (located at the rear of the picking heads). Raise the picking heads to check and clean their underside.

Note: The picking heads are held up by hydraulics—DO NOT climb underneath them unless the heads are safely secured in the raised position.

Cabin

- Check externally under and around the cabin. Check under the mats in the cabin. Check the air-conditioning system (where fitted), including ducts and filters.

Air ducts

- Remove/open all cover/inspection panels. (These horizontal ducts convey cotton from the front picking section to the basket.)
- Check and clean all air ducts from the top.

Basket

- Check and clean the basket roof.
- Access the internal parts of the basket through the hinged door on the roof. (You will need a ladder to climb into the basket.)
- Tip or elevate the basket (depending on the model) to check and clean the underside, drive shaft assemblies, blower fan and hollow basket support frames (located on the left- hand side of some models).

Note: The meshed surface area of the basket will NOT support a person's weight—walk only on the perforated metal walkways that run from the back to the front of the machine. The basket is lifted by hydraulics—DO NOT climb under the basket unless it is properly and safely secured in its raised position.

Undercarriage/chassis

- Check all undersides of the machine, chassis rails and telescopic rear axle if fitted.

Engine

- Remove the cover panel to expose the top of the radiator. (This can be done when the basket is in the raised position.)
- Remove or open all screens on the engine, radiator and fuel bays.

Tyres

- Check for soil or any other contaminants.

Remember: The key to successful cleaning is more than just ticking off a checklist
You should be thorough, systematic and consistent**.**
CHECK, CLEAN, RECHECK

4.4 Dump trucks[4]

CAUTION
DO NOT use high-pressure water jets in compartments that house electronic components.

Complete the basic cleaning outlined in Table 2 and also check the following areas, cleaning as necessary.

Cabin

- Remove any rubber floor mats and clean the floor surface.
- Remove and clean all door rubbers and internal door paneling.
- Clean all windowsills.
- Remove and clean under the seat, including the rubber seat shroud.
- Remove any non-affixed floor panels and clean underneath them.
- Remove and clean the rubber pedal covers.
- Clean inside all air-conditioning vents and ensure there is access for inspection.
- Clean inside all joystick controls and ensure there is access for inspection.
- Check the cabin roof and walls, both inside and out.
- Clean the ladder (which may have a hollow frame) and clean under each footstep.
- Clean inside all light covers and ensure there is access for inspection.
- Check for a false floor under the cabin and if it is present, remove it for cleaning.
- If the vertical cabin housing can be flushed via drainage holes, do this.

Front end and radiator

- Remove the radiator grill (both outside and inside). Access will be required for inspection.
- Loosen the radiator shroud to let loose debris fall through.
- Check either side of radiator for vertical hollow support structures. If they are present, flush them.
- Clean inside all light covers. Access will be required for inspection.
- If the front drawbar has drainage holes, flush them.
- If the vertical channels either side of the radiator have drainage holes, flush them.
- Check the air filter (using compressed air if necessary).
- Remove any non-affixed panels from the front of the cabin to access the air-conditioner.

Engine bay

- Remove the air-filter pre-cleaner cover and clean it.
- Remove the air-filter and clean it with air.
- Clean inside the fan belt flywheels (harmonic balancer).
- Check all surfaces of the engine block, including between tappet covers.
- Remove any belly plates and clean them.
- Remove all non-affixed engine covers for cleaning and inspection.
- Remove all engine cover rubbers for cleaning and inspection.
- Check the engine housing for any open-ended or spot-welded hollow support framework and flush it clean.
- Flush the radiator and oil cooler from both sides to ensure that the fin/core is clean.
- Check the battery boxes. Loosen the batteries and clean under them.
- Check all wiring harnesses.

[4] Adapted from the Australian Department of Agriculture's cleaning guide and checklist for dump trucks—see More information, page 30.

- Check under all hydraulic looming.
- Ensure that all engine mounts are clean.
- Ensure that all surfaces of the sump and the engine block are clean.
- Remove all contaminated grease from the universal joints.
- Clean inside all light covers. They will need to be accessed for inspection.
- Remove zip-ties and electrical tape that hold electric and hydraulic hoses together—this will facilitate cleaning and inspection.
- Flush under all non-slip checker-plate footings.
- If the wishbone between the front wheels is hollow, flush it via the openings inside the struts.

Rear chassis

- Clean all surfaces of the oil and fuel tanks.
- Check all wiring harnesses.
- Check under all hydraulic looming.
- Clean all universal joints to ensure they are free of contaminated grease.
- Clean all surfaces of the chassis rails.
- Clean all internal ledges and hollow cavities inside the track frames.
- If the carrier rollers above the tracks have a hollow vertical support structure, clean it.

Tyres and rims

- Ensure that all cracks and splits in tyres are free of contamination.
- When checking inside wheel rims, you may need to remove non-affixed plates to access the brake drums and inner rim.
- Remove dual tyres for checking.

Dump tray

- Check all surfaces of the tray for cracks, splits or evidence of repair. If any are detected, they will need to be investigated for internal contamination (if double skinned).
- Check all rubber mounts on the underside of the tray.

Remember: The key to successful cleaning is more than just ticking off a checklist
You should be thorough, systematic and consistent**.**
CHECK, CLEAN, RECHECK

4.5 Excavators

CAUTION
DO NOT use high-pressure water jets in compartments that house electronic components.

Complete the basic cleaning outlined in Table 2 and also check the following areas, cleaning as necessary.

Cabin

- Remove any rubber floor mats and clean the floor surface.
- Remove and clean all door rubbers and internal door paneling. Clean all windowsills.
- Remove the cabin wall lining and clean behind it.
- Remove and clean under the seat, including the rubber seat shroud.
- Remove any non-affixed floor panels and clean underneath them.
- Remove and clean the rubber pedal covers.
- Remove and clean inside the joystick control housing.
- Check all air-conditioning vents, including the air-conditioning filter. You may have to remove some paneling for cleaning.
- Check the cleanliness of the cabin roof, both inside and out.
- Clean the ladder to the cabin (if applicable). It may have a hollow frame, so check for possible entry points. Clean under each footstep.
- Remove all light covers and check the cavities behind them.
- If the cabin housing can be flushed via drainage holes, flush it with water.

Body and engine bay

- Remove and clean the air-filter pre-cleaner.
- Remove the air-filter and clean it with compressed air.
- Check all surfaces of the engine block, including between tappet covers.
- Clean inside the fan belt flywheels (harmonic balancer).
- Remove all non-affixed engine covers and clean all surfaces.
- Check the engine covers for hollow support frameworks and flush them to ensure that they are clean.
- Remove and clean the engine cover rubbers.
- Check either side of the radiator for vertical hollow support structures and, if they are present, flush them to ensure that they are clean.
- Loosen the radiator shroud to let loose debris fall through.
- Check inside all wiring harnesses.
- If necessary, remove the counterweights to allow cleaning and inspection.
- Remove and check the engine cover rubbers.
- Remove zip-ties and electrical tape that hold hydraulic hoses together—this will facilitate cleaning.
- Loosen the batteries and clean under them.
- Flush the radiator and oil cooler from both sides to ensure that the fin/core is clean.
- If the bottom rails along the sides are open ended, flush them with water.
- Check the sump and engine block.
- Remove all contaminated grease from the hydraulic rams.
- Check all lights and cavities behind them.
- Check all rubber engine mounts.
- Flush under all non-slip checker-plate footings to ensure they are clean.

Tracks, rollers and frame

- Remove the track rock guards to allow access to inside the track frames.
- Once the rock guards have been removed, check where the bolts attach to the frame. If this is hollow, flush it.
- Remove any individual rubber track pads (usually on small excavators).
- Remove the motor cover plates and clean inside the drive motor.
- Individually clean each countersunk bolt hole on the rollers.
- Flush the hollow track frame ends to remove all contamination.
- Remove all non-affixed covers and plates.
- Turn the roll tracks one revolution to check each track pad and the countersunk bolts on the rollers and idler wheels.
- Clean behind the sprockets.
- Thoroughly clean the spring adjuster inside the track frame.
- If the carrier roller above the tracks has a hollow support structure, check it.
- If the excavator has telescopic tracks (generally only small excavators), extend them and clean inside them.
- Clean all internal ledges and hollow sections inside the track frames, as these can harbour contamination.

Boom stick and bucket

- Check the front and back of the bucket for any cracks, splits or evidence of repair. If any are detected, the inside will need to be verified as clean.
- Remove all non-affixed wear plates.
- Flush spot-welded wear plates on the back of the bucket.
- Remove all cutting teeth (boots) from the bucket.
- If the boom arm is hollow, remove all external non-affixed plates.
- Clean all knuckles, removing all contaminated grease.
- Remove the cutting teeth from the blade.

Remember: The key to successful cleaning is more than just ticking off a checklist
You should be thorough, systematic and consistent**.**
CHECK, CLEAN, RECHECK

4.6 Headers and harvesters

CAUTION
DO NOT use high-pressure water jets in compartments that house electronic components.

Complete the basic cleaning outlined in Table 2 and also do the following checks, cleaning as necessary.

All harvesters

Check and clean:

- the area under the skid plate.
- each header knife and finger.
- the auger located horizontally across the header.
- the area behind any cover on the header.
- the area within any belts on any draper front (if fitted).
- the feeder house.
- the cabin floor area.
- the cleaning fan and the area between the bottom of the fan housing and any shield under the fan housing.
- the chassis, including inside any rail ledges, the back axle-beam and the undercarriage.
- any tailing auger.
- any sieve area, including the full length and width of the grain pan.
- any grain bin area, including any auger.
- the engine compartment, including the radiator core.
- any grain or repeat elevator, including any cups and rubber flights.
- any straw spreader or chopper.
- the tyres and rims.

Conventional harvesters

Check and clean:

- the threshing or separating area, including the drum and concaves behind the rasp bars and lead-in plates and around the concave wires.
- the beater drum, including the area between the drum and walkers.
- the straw walkers, including the beater and the chaff pan, underneath the straw walker and any concealed areas under rubber air flaps.

Rotary harvesters

Check and clean:

- the external top and sides of the conical section of the rotor cage.
- the areas inside the top of the conical section.
- the threshing or separating area, including along the rotor cage.

Remember: The key to successful cleaning is more than just ticking off a checklist
You should be thorough, systematic and consistent**.**
CHECK, CLEAN, RECHECK

4.7 Mini tractors

CAUTION
DO NOT use high-pressure water jets in compartments that house electronic components.

Complete the basic cleaning outlined in Table 2 and also check the following areas, cleaning as necessary.

Tyres and rims

- Check all parts of the tyres and rims, including the inner sides of the rims.
- Check for gaps in split-type rims.
- Check for any cuts and gashes in the tyres.
- Check any wheel-mounted counterweights.

Chassis

- Check the inside of the chassis rail ledges.
- Carefully check for hollow areas and cover plates that may conceal voids.
- Check voids in the area between the gearbox and the engine. (Several models have a large void that is accessible from underneath)
- Check voids in the counterweights. You may need to remove multiple counterweights for cleaning.
- Check any hollow sections in the sub-frame under the motor that links the chassis rails.

Engine

- Remove the grill (usually by unscrewing two wing nuts) and clean it.
- Remove the wire mesh screen from the front of the radiator and clean it.
- Check and clean the fan shroud at the rear of the radiator.
- Remove and clean the air filter cover, remove the dust dish from the air filter cover, and remove and check the air filter/cleaner. (If you cannot clean these satisfactorily, you may need to destroy them and install new ones.)
- Check around the fuel tank and brackets for build-up of soil and plant material.
- Check all areas in the bonnet and in the engine bay for hollows and clean them.

Other

- Check the external rear brake assemblies and the common shaft for the brake and clutch pedals.
- Check the foot plates and mounting brackets.
- Check the hollow sections in the mudguards, the joints between the mudflaps and the mudguards and the wiring looms under the mudguards.
- Check and clean the toolbox under the seat or the fuel tank. Empty it before cleaning.
- Check and clean any torn seats and exposed foam at the rear of the seat. (Soil and plant material can become lodged in the cushioning.)
- Check and clean the rear axles, in particular the track-width adjustment pinholes.
- Check and clean the drawbar and mounting.
- Check and clean the three-point linkages and operating levers.

Remember: The key to successful cleaning is more than just ticking off a checklist
You should be thorough, systematic and consistent**.**
CHECK, CLEAN, RECHECK

4.8 Power Take Off (PTO) rotary hoes

CAUTION
DO NOT use high-pressure water jets in compartments that house electronic components.

Complete the basic cleaning outlined in Table 2 and also do the following checks, cleaning as necessary.

- Check and clean the tyres and mounting bolts for soil. You may need to remove the tyres or loosen them from their adaptors on the horizontal shaft so that you can remove soil from the void.
- Remove or loosen the skid/wear plate from the vertical gear casing. (This casing is filled with oil, so make sure you remove or loosen only those bolts securing the plate.)
- Check the body of the hoe for double skins or voids that could contain soil due to inadequate or incomplete weld joints.
- Check and clean all areas where mudflaps are attached or plates overlap.
- Check for hollow sections in reinforcing ribs.
- Check and clean the three-point linkage attachment points, the PTO knuckles and tube, the universal joints and the shafts.
- Check and clean all ground-engaging areas for signs of wear that could allow the ingress of soil or plant material.
- Rotate the rotary shaft and probe for plant material that may be caught in the bearing housing at the ends (or middle if twin shafted).
- Check and clean the frame, supports and mounts for the trailing wheels. These are often hollow sections.
- Check and clean the trailing wheels. These are usually hollow and are made from two pieces of metal welded together. With wear, the metal and welds crack and the wheels fill with soil.

Remember: The key to successful cleaning is more than just ticking off a checklist
You should be thorough, systematic and consistent**.**
CHECK, CLEAN, RECHECK

4.9 Track-type dozers

CAUTION
DO NOT use high-pressure water jets in compartments that house electronic components.

Complete the basic cleaning outlined in Table 2 and also check the following areas, cleaning as necessary.

Cabin
- Check externally under and around the cabin.
- Check under the mats in the cabin.
- Remove or lift the seat, then remove or lift any floor panels and check the top of the transmission.
- Check that the air-conditioner filter (if fitted) is clean by shaking or tapping it.

Tracks and track frame
- Examine the tracks carefully.
- Remove the inspection/cover plates and check inside the track area.
- Check the idler wheels. (These support the tracks.)

Belly plates
- Remove and check behind these plates.

Rear plates
- Remove and check behind these plates.

Hydraulic cover plates
- Remove and check behind these plates.

Engine
- Check the radiator core and engine area.
- Remove and check the air filter/cleaner. Replace it if it is clogged with contaminants.
- Check carefully the void between the oil and radiator cores.

Battery box
- Lift or remove the battery and check under it for contamination. (The battery box may be at the side or at the rear or under the seat.)

Fuel cells
- Remove these and check for any soil and plant material packed between the tank and the frame.

Blades
- Ensure that the edges of the blades (top/bottom) are not split, as this allows soil to pack very tightly in the hollows.
- Check the truncation arms.
- Check carefully the pivot points and adaptors at the rear of the front blade—these allow the blade to change height and angle. Sometimes soil will be compacted and difficult to dislodge.
- Check all hollow sections.

Ripper support frame

- Check carefully to see if any contaminants have entered this hollow section. You may need to remove the tines.

Tines

- Check these carefully. You may be able to remove contamination by water blasting, however you may need to remove the tines for cleaning in some cases.

Ripper points

- A pin holds the ripper points in place. Check for any soil and plant material compacted under the ripper points.

All areas

- Check for any hollow sections or channels and determine whether there is a possible entry point for contamination. Check whether the plates are covering compartments or spaces that may have collected soil or plant material.

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You should be thorough, systematic and consistent**.**
CHECK, CLEAN, RECHECK

4.10 Wheeled loaders[5]

CAUTION
DO NOT use high-pressure water jets in compartments that house electronic components.

Complete the basic cleaning outlined in Table 2 and also check the following areas, cleaning as necessary.

Cabin

- Remove any rubber floor mats and clean the floor surface.
- Remove and clean all door rubbers and internal door paneling. Clean all windowsills.
- Remove and clean under the seat, including the rubber seat shroud.
- Remove any non-affixed floor panels and clean underneath them.
- Remove and clean the rubber pedal covers.
- Remove the wall lining and clean behind it.
- Clean all air-conditioning vents, including the air-conditioning filter. You may have to remove paneling to do this.
- Remove the joystick control housing and clean inside it.
- Check the cabin roof, both inside and out.
- If there is a false floor under the cabin, remove it for cleaning.
- Clean the ladder to the cabin (which may have hollow frame) and clean under each footstep.
- Remove all light covers and check the cavities behind them.
- If the cabin housing can be flushed via drainage holes, do this.

Engine bay

- Check all surfaces of the engine block, including between tappet covers.
- Remove the air-filter pre-cleaner and clean it.
- Remove the air-filter and clean it with compressed air.
- Clean inside the fan belt flywheels (harmonic balancer).
- Remove any belly plates and clean them.
- Remove all non-affixed engine covers to allow access and clean all surfaces.
- Check the engine covers for hollow support framework and flush it to ensure that it is clean.
- Remove all engine cover rubbers and clean them.
- Flush the hollow chassis rails either side of the engine via drainage holes on the underside of the rails. Remove the belly plate bolts for access if necessary.
- Check the battery boxes on either side of the engine. Loosen the batteries and clean under them.
- Flush the radiator and oil cooler from both sides to ensure that the fin/core is clean.
- Loosen the radiator shroud to let loose debris fall through.
- Check either side of the radiator for vertical hollow support structures and flush these to ensure that they are clean.
- Check inside all wiring harnesses.
- Check under all hydraulic looming.
- Remove zip-ties and electrical tape that hold hydraulic hoses together—this will facilitate cleaning.
- Check all surfaces of the fuel cell (which generally sits below the radiator and engine).
- Check the support arm behind the differential, as this can be hollow and harbour contamination.

[5] Adapted from the Australian Department of Agriculture's cleaning guide and checklist for wheel loaders—see More information, page 27

- Check all rubber engine mounts.
- Clean all surfaces of the axles and differential.
- Check the sump and engine block.
- Check all lights and the cavities behind them.
- Remove all contaminated grease from universal joints.

Front end and bucket

- Remove the front housing cover plate to allow better access to hydraulics.
- Remove all cutting teeth (boots) from the bucket.
- Remove all non-affixed wear plates from the bucket.
- Check the front and back of the bucket for any cracks, splits or evidence of repair. If any are detected, the inside will need to be verified clean.
- Check any light mounts on the front wheel arches, as these areas are generally hollow and require cleaning.
- Remove all contaminated grease from all pivot points.
- Bucket push arms are generally sealed units, however check for hollow areas and drainage points.
- Flush spot-welded wear plates on the back of the bucket.

Tyres and rims

- Check each tyre for cracks or splits that contain seeds, soil or any other risk material.
- You may need to remove the plates on the inside wheel rims to access the brake drums, then remove these and clean them thoroughly.

Other areas

- Check all wheel arches for hollow support frameworks. You may also have to loosen these from the chassis to clean where the arches join the frame.
- Clean all surfaces of the oil tank (which is generally near the ladder to the cabin).
- Clean under all non-slip checker-plate surfaces.
- If the rear drawbar is hollow, remove the towing pin and flush the drawbar.
- Remove all contaminated grease, including around pivot points.

Remember: The key to successful cleaning is more than just ticking off a checklist
You should be thorough, systematic and consistent**.**
CHECK, CLEAN, RECHECK

4.11 Wheeled tractors

CAUTION
DO NOT use high-pressure water jets in compartments that house electronic components.

Complete the basic cleaning outlined in Table 2 and also do the following checks, cleaning as necessary.

Tyres and rims

- Check and clean all parts of the tyres and rims, including the inner sides of the rims.
- Check between dual wheels (if fitted).
- Check any wheel-mounted counterweights.
- Check for any gashes or cuts in the tyres.

Engine

- Check the radiator core and grill for residues.
- Check the void between the oil cooler and radiator. (The oil cooler may be hinged or on a slide.)
- Remove and check all air filters/cleaners, pre-cleaners and cyclone-style dust separators. If you cannot clean them satisfactorily, you may need to destroy them and install new ones.
- Check and clean sound-deadening foams and heat shields. (Foams can become impregnated with dust.)

Cabin

- Check externally under and around the cabin.
- Check under the mats in the cabin and in any void or on any skirt under suspended seats.
- Check air-conditioner filters (if fitted). Most large tractors will have a false cabin roof housing the air-conditioning unit, so remove or open the false roof for access.
- Check the integrity of rubber door and window seals. If they are torn, soil and plant material will be sucked into them and trapped.
- Check the void behind consoles and the dashboard.

Chassis and vehicle body

- Check the inside of the chassis rail ledges and the back axle-beam and the undercarriage of this area.
- Check any hollow sections in the front axle tubes.
- Check and clean all toolboxes and battery boxes. These are often under the cabin steps or in the engine bay.
- Check any voids in the rear brake assemblies.
- Check any hollow sections in the drawbars and in the retractable/extendable three-point linkages.
- Check and clean single counterweights. You may need to remove multiple counterweights to clean the voids.
- Check and clean mudguards and wheel flares, and look for hollows and crevices.
- Check and clean roll cages and roll bars. Look for holes and gaps where these are attached to the vehicle.
- For four-wheel drives, check the torque tube (front drive shaft guard) for holes or poor attachment.
- Check and clean the power take-off (PTO) area, PTO shaft, universal joints and shaft covers/PTO tubes.

- Check and clean the wiring looms in split protective conduit.

Note: Some agricultural tractors will have a rear carryall mounted on the three-point linkages or a forward-mounted forklift or bucket/scoop attachment—check these carefully.

Buckets, blades and scoops

- Check and clean all areas of the blade. Look for holes or double skins.
- Remove, check and clean the cutting teeth, adaptors and wear plates on the blades.
- Check and clean the hydraulic arms and supports. Look for hollows that may contain soil and plant material.

All areas

- Check for any hollow sections or channels and determine if there is a possible entry point for contamination. Check whether any plates are covering a compartment or space that may have collected soil and plant material.

Remember: The key to successful cleaning is more than just ticking off a checklist
You should be thorough, systematic and consistent**.**
CHECK, CLEAN, RECHECK

5 More Information

5.1 Invasive plants

To see a current list of Queensland's invasive plants, visit daf.qld.gov.au.

5.2 AgGuide—Machinery hygiene

A hard-copy handbook that includes information about machinery inspection and cleaning to prevent the spread of invasive plants, pests and diseases and is available from the New South Wales Department of Primary Industries Tocal College. Visit www.dpi.nsw.gov.au for details.
https://www.tocal.nsw.edu.au/publications/list/farm-management/agguide-machinery-hygiene

5.3 Australian Defence Force military equipment guidelines for offshore inspection

These guidelines are used by Australian Defence Forces. They are available at

5.4 DAWR machinery cleaning guides and checklists

These guides and checklists have been developed to help importers and offshore cleaners meet Australia's import permit conditions (free of biosecurity risk material) as found in BICON, the Biosecurity Import Conditions system.
These conditions are more onerous than those required by Queensland legislation. The department has provided a generic checklist as well as cleaning guides and checklists for:

- articulated dump trucks
- caterpillar dozers
- compactors
- dump trucks
- excavators
- forklifts
- Hitachi DX40 dozers
- Komatsu dozer
- M motor grader
- medium-sized dozers
- mini excavators
- mini tractors
- motor graders
- scrapers
- skid steer loaders
- wheel loaders.

The guides and checklists illustrate and describe the many areas in machinery that commonly harbour risk (soil and plant) material. Visit http://www.agriculture.gov.au for more information.

http://www.agriculture.gov.au/import/goods/vehicles-machinery/regulations/guides-checklists (accessed 1/03/2019)

5.5 **USA** Armed Forces Pest Management Board Technical Guide No.31

This technical guide (published in 2017) provides information on cleaning techniques and inspection procedures currently used by the United States Department of Defense for washing and reviewing equipment, supplies and vehicles. Visit www.dodinvasives.org for more information.https://www.acq.osd.mil/eie/afpmb/docs/techguides/tg31.pdf (accessed 1/03/2019)

5.6 Tasmanian wash-down guidelines for weed and disease control

These guidelines establish the standard for washing down machinery, vehicles and other equipment to minimise the risk of spreading weed seeds, some insects and plant pathogens in Tasmania. Visit www.dpiw.tas.gov.au to view the guidelines. https://dpipwe.tas.gov.au/Documents/Washdown-Guidelines-Edition-1.pdf (accessed 1/03/2019).

Appendix C CopperString Biosecurity Cheat Sheet

COPPERSTRING BIOSECURITY – CHEAT SHEET

Project Requirement:

- All Plant, Equipment (including vehicles) and materials are to be declared pest, weed and disease free prior to arriving at site.
- All declarations (excepting materials) are to be completed by a certified Inspector: a person that has completed nationally recognised training and achieved one of the following units of competency:

  (i) RTD 2312A Inspect machinery for plant, animal and soil material and RTD 2313A Clean machinery of plant, animal and soil material; or

  (ii) AHCBIO201A Inspect and clean machinery for plant, animal and soil material.
- All materials declarations are to be provided by the Supplier.

Forms:

- Third Party Certified Weed Hygiene Declaration Form (external)
- CopperString Biosecurity Hygiene Book

Process:

- Certified inspectors will be issued a unique CopperString Biosecurity Hygiene Book (individual use only) upon evidence of competency.
- The original current declaration is to remain in vehicle at all times (driver visor location).
- Superseded declaration forms are to be disposed of.
- Duplicate copy is to be provided to the Land Agent for landholder collection.
- Triplicate copy is to be retained in the Book for project records.
- Post contractor works and / or completed books are to be returned to JV.

Site Movement	Hygiene Requirements
From point of origin to Project (staging area) via existing road network	Third Party Certified / issued Form + 2 copies
Travel to and from camp on formed road	Current Form remains valid
Working in a road reserve only (via camp with no private property access)	Current Form remains valid unless weeds present Blowdown recommended between movements
Access to private property from camp and repeat to same property following day(s)	Property specific Form (CopperString Biosecurity Hygiene Book) Form remains valid providing no other unformed accesses used
Access to private property from camp (with new property access planned the following day)	Property specific Form (CopperString Biosecurity Hygiene Book) Council washdown facility use overnight Issue NEW property specific form (CopperString Biosecurity Hygiene Book)
Access to private property 2 from private property 1 on the same day	Setup and use of temporary washdown bay or Council washdown facility whichever is closer (Supervisor direction) Issue NEW property specific Form (CopperString Biosecurity Hygiene Book)

Roles and Responsibilities:

Role	Responsibility
Contractor Employee	Ensuring valid weed declaration available at all times. Undertaking washdown activities.
Authorised Inspector	Issuer of Forms.
Supervisor	Verify valid Forms. Collect and supply Forms to Land Agent prior to entry. Scheduling cleandown activities.
Environmental Advisor	Compliance verification with biosecurity requirements.

Weed Presence:

- Refer to Project GIS mapping available (Heat Maps)
- Land Access Permit attached maps

Weed Identification Resources:

Restricted invasive plants | Business Queensland
Weeds and Vegetation – Mount Isa City Council
Restricted Invasive Plants & Animals - Townsville City Council
Pests – Cloncurry Shire Council
North West Queensland Regional Biosecurity Plan 2022-2027

References:

- CopperString (final) EIS – Chapter 8 - Biosecurity
- CopperString (final) EIS – Appendix U – Concept Biosecurity Plan
- Qld Biosecurity Act 2014
- CopperString JV Construction Environmental Management Plan (Version D)
- CopperString JV Early Works Construction Environmental Management Plan (Version A)

SAMPLE BIOSECURITY DECLARATION FORM

COPPERSTRING 2.0 POWERING NORTHERN QUEENSLAND	Biosecurity Hygiene Declaration	XX

Must be used for all **Vehicles, Mobile and fixed Plant and equipment**.

Date:	**Company:**	
Location of Washdown Bay:		
(Proposed) Site/Property Name:		
Vehicles, Mobile and fixed plant and equipment Details:	**Make:**	**Model:**
Registration / Serial Number:		**KM's/Hours:**

Is the **Vehicle, Mobile and fixed** plant and equipment clean of organic material upon inspection? (please circle) YES / NO

Please tick the applicable boxes or circle N/A dependent on which Vehicle, Mobile and fixed plant and equipment *this declaration is for.*

Wheels / Spares	☐ N/A	Radiator	☐ N/A	Buckets / Attachments	☐ N/A
Wheel Wells	☐ N/A	Bumpers (Front & Rear)	☐ N/A	Tracks	☐ N/A
Suspension	☐ N/A	Engine Bay	☐ N/A	Inspection Plates	☐ N/A
Chassis Rails	☐ N/A	Front Grill	☐ N/A	Belly Plates	☐ N/A
Tray	☐ N/A	Cabin / Floor mats	☐ N/A	Tow bar	☐ N/A

Is the vehicle carrying a load? (please circle) Yes / No / NA

Is there an attached separate Hygiene declaration for the material by the supplier? (please circle) Yes / No / NA

This declaration for this vehicle, mobile and fixed plant and equipment will remain valid based on the following conditions:

- The vehicle, mobile and fixed plant and equipment does not come into contact with restricted matter/declared pests, weeds and disease; and
- Vehicle / plant / equipment stays on formed roads (does not apply to unsealed private property tracks).

If these conditions are breached, the vehicle, mobile and fixed plant and equipment is to cleaned at a designated washdown bay and a new declaration form is to be issued prior to moving into to a new site.

I declare that the information provided in this declaration is true and correct and that I am suitably trained to inspect/clean machinery, tools and equipment to preserve biosecurity.

Name:	**Occupation:**
Signature:	**Date:**
Authorised Inspector Certificate Number:	

Unapproved

Appendix D Imported Goods – Biosecurity Risk

https://www.agriculture.gov.au/sites/default/files/documents/biosecurity-risk-treatment-guide.pdf

Australian Government

Department of Agriculture, Fisheries and Forestry

Imported goods

Biosecurity risk treatment guide

Biosecurity Operations Division

Version 7.0



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1 Introduction

One of the Department of Agriculture, Fisheries and Forestry's (department) primary roles is to address biosecurity threats to Australia's primary production sectors, the environment and human health, while also supporting tourism and trade.

To do this, the department provides import and export inspection and certification to help retain Australia's highly favourable animal, plant and human health status and wide access to overseas export markets.

The department also manages biosecurity controls at our borders to minimise the risk of exotic pests and diseases entering the country.

Imported goods may be subject to targeted or random inspection by biosecurity officers who are trained to look for biosecurity risks on imported goods. In most cases, import conditions relating to imported goods that pose a specific and identifiable biosecurity risk are stipulated in the department's Biosecurity Import Conditions system (BICON).

It is important that the reader notes that this guide does not apply to situations where a BICON case is available for the imported goods. This is because known biosecurity risks, and the treatments available to address those risks, are usually documented in the relevant BICON case.

There may be instances where biosecurity risks are detected on imported goods, but there is no BICON case available that documents suitable treatment options. In these cases, this guide provides information on the department approved treatment options available to address a specific biosecurity risk.

The application of more than one treatment type may be necessary to mitigate multiple biosecurity risks. All expenses for any treatment, supervision of treatment and/or reinspection (if required) are borne by the importer.

2 What is included in this guide?

The tables within this guide provide department approved treatment information for:

- Importers, brokers, import agents and external stakeholders involved in the importing industry.
- Biosecurity officers, supervisors and managers to assist in determining appropriate treatments.

These treatments apply only to biosecurity risks detected at the initial inspection as biosecurity risks that may occur:

- on the surfaces of imported goods
- as non-commodity based risks associated with imported goods
- in packaging not associated with the imported goods but used to facilitate safe transport.

This document does not contain treatment options for:

1) Biosecurity risks with the goods itself – treatment information for specific goods that pose a biosecurity risk can be found in their BICON case located on the department's website.
2) Post border treatments.
3) Disinfection treatments approved for use at specific classes of Biosecurity Approved Premises (AA sites) – a list of broad spectrum disinfectants can be found on the department's website. Please note some of these options are not available at initial inspections.
4) Biosecurity waste treatments – whilst some biosecurity risks detected on goods are usually treated as biosecurity waste, there are aspects of the treatment of biosecurity waste from, for example vessels or AA sites, not covered in this document.

3 Biosecurity risks

Table 1 describes examples of biosecurity risks that may be detected on imported goods, non-commodity items and packaging.

Table 1 Examples of biosecurity risks on imported goods

Item	Examples
Live animals – vertebrates	frogs, geckos, birds, rodents, reptiles
Animal material	hair, fur, skin, faeces, shell, blood, and fluids, feathers, honey, flesh, bone, horn
Animal material – evidence	feathers, fur, faeces
Plants – live	plants, weeds, sprouted seeds, propagatable material
Plant material – reproductive	pollen, spores, flowers, fruit, vegetables
Plant material – seeds	seeds, pods
Plant material – fresh	fresh leaves, gum, stems, pods, roots, flowers
Plant material – dry	dried leaves, branches, roots, straw, wood
Plant material – bark	bark
Invertebrates – timber pests	borers, wasps, termites, ants, larvae, eggs, beetles
Invertebrates – flying pests	flies, moths, bees, wasps
Invertebrates – fresh produce pests	beetles, thrips, larvae, mites, flies, caterpillars
Invertebrates – stored product pests	beetles, larvae, eggs, casings
Other invertebrates of concern – terrestrial	flatworms, nematodes, earthworms
Other invertebrates of concern – aquatic	sponges, jellyfish, starfish, barnacles, algae
Invertebrates seeking refuge – hitch-hikers	ants, bees, wasps, moths, spiders, grasshoppers, butterflies
Invertebrates – evidence	wasps nests, mud nests, wings, shells, casing, frass
Snails and slugs	snails, slugs
Snails and slugs – evidence	shells, eggs, trail marks
Plant pathogens	fungi, lichen, bacteria, viruses, moulds, protozoa, phytoplasmas
Soil	dirt, mud, clay, sand
Water	pools of water, water in receptacles, articles used with water
Water – evidence	water marks

4 Treatment

4.1 Treatment of goods

Where a biosecurity officer suspects, on reasonable grounds, that the level of biosecurity risk associated with the goods that are subject to biosecurity control is of an unacceptable level, the officer may require biosecurity measures to be taken in relation to the goods. These biosecurity measures allow a biosecurity officer to manage biosecurity risks to an acceptable level.

Biosecurity officers have the power to require that goods be treated in a specific manner.

4.2 Treatment that may damage goods

The *Biosecurity Act 2015* outlines the requirements for notifying the person in charge of goods where a biosecurity officer suspects on reasonable grounds that the treatment required is likely to damage the goods.

Note: If the biosecurity officer suspects on reasonable grounds that the goods pose a high level of biosecurity risk and need to be treated as soon as practicable, the officer will be able to carry out the specified treatment without having to notify the person in charge.

4.3 Request for agreement to treat goods (where the treatment may damage goods)

Before any treatment is carried out on the goods, a biosecurity officer must, by notice in writing or orally, inform a person in charge of the goods that the goods are required to be treated in a specified manner which is likely to result in damage to the goods and request the person to agree to the treatment of the goods.

If a notice is given to the person in charge of the goods requesting their agreement to treatment, and the person does not respond or does not agree to the treatment within 30 days, a biosecurity officer may in writing request that the person arrange for the goods to be dealt with or destroyed within a specified period. If the person in charge of the goods does not comply with this request the biosecurity officer may take possession of the goods and cause them to be exported out of Australian territory, destroyed or otherwise disposed of.

A biosecurity industry participant is excluded from the definition of 'person in charge' of goods if the biosecurity industry participant is only in possession or control of goods because of a direction given to the participant by a biosecurity officer. This reflects that it would not be appropriate for the biosecurity industry participant to agree to treatment that may damage goods, where they do not have a relationship to the owner of the goods and the goods are only in their possession because of the actions of the biosecurity officer. In this case, the person in charge who is receiving the request to treat goods must have a relationship to the owner of the goods.

4.4 Treatment of high value goods

If the goods are high-value goods—that is the value of the goods is greater than the amount prescribed in the regulations—the goods must not be treated in a way that the biosecurity officer suspects is likely to damage the goods without the written approval of the Director of

Biosecurity. This extra step reflects the impact ordering such a treatment might have on the owner of the goods and the potential loss of value caused by the treatment.

Regardless of the value of the goods, if the treatment is likely to damage the goods, a person in charge must be asked to agree to the treatment (see Treatment that may damage goods).

5 Approved treatments

Department approved treatments that address known biosecurity risks are categorised as:

- Treatment types – approved types of treatments that are commonly used in biosecurity practices
- Cleaning treatments – approved treatments that clean biosecurity risks from a surface
- Disinfection treatments – approved treatments that disinfect a surface
- Physical removal – total removal of the contaminant
- Destruction – approved methods to destroy biosecurity risks.

5.1 Size limits

Size limitations will apply in most circumstances. Factors to consider are the size of the treatment chamber (autoclave, fumigation and incineration), size of the combined load, or size of the actual material requiring treatment. In some circumstances, information in this document may not be appropriate for the situation.

5.2 Timeframes

All timeframes must be applied within given timeframes as directed.

5.3 Availability

Availability of treatments is dependent on treatment provider availability. Not all treatments listed are available in all Australian states and territories.

6 Treatment types

Table 2 lists and describes the main department approved treatment types and any restrictions, limitations or damage that may occur.

Table 2 Department approved treatment categories

Treatment	Definition	Restrictions, limitations and damage
Autoclaving treatment	Sterilisation using steam under high pressure to control biosecurity risks.	Size and goods limitations apply.
Cleaning treatment	The use of water or air that cleans biosecurity risks from a surface. The air or water may or may not be under pressure.	n/a
Cold treatment	The use of cold air in the control of biosecurity risks.	Size limitations apply. May cause fibreglass to become brittle. This treatment is not suitable for cold climate timber pests.
Devitalisation treatment	Rendering the goods incapable of germination, growth of further reproduction.	Other limitations can be due to the type of chemical, dosage applied, duration of treatment and method and application of dipping the plant material.
Disinfection treatment	The application of a department approved chemical to the surfaces of non-living and non-porous objects to control biosecurity risks.	May cause damage to leather and some metals such as aluminium, zinc, chrome, and similar alloys. May cause plastic to melt. May cause lacquer to blister or run. May also cause possible damage to surfaces or electrical components.
Ethylene oxide fumigation treatment	Sterilisation using ethylene oxide gas under pressure in the control of biosecurity risks on instruments, equipment and other goods.	Phytotoxic to many plants, fresh fruits and vegetables. Not for use on food or products that will contact skin – refer to the Australian Pesticides and Veterinary Medicines Authority website.
Freezing treatment	The use of cold air in the control of biosecurity risks.	Size limitations apply.
Gamma irradiation treatment	Exposure of goods to gamma rays in the control of biosecurity risks.	Size and goods limitations apply. May cause animal hides or pelts to lose hair or become brittle. May discolour or damage silica products (for example mirrors, pearls, fibreglass, some glass, white porcelain, sands and plastics, such as polyurethane packaging). Will damage commodities that have built-in integrated circuits. Prohibited for use on food for human consumption unless specific permission is given by FSANZ.
Hot air treatment – dry	The use of hot, dry air in the control of biosecurity risks.	Products may become brittle or fragile, or smoulder or ignite with this treatment. Will dry out products containing any liquid or moisture. May damage plastic or goods containing glue. For goods limitations and further information, refer to the department's Heat Treatment Standard.
Hot air treatment – moist	The use of hot, humid air in the control of biosecurity risks.	Size limitations apply.

Treatment	Definition	Restrictions, limitations and damage
Methyl bromide fumigation treatment	Fumigation using methyl bromide gas in the control of biosecurity risks.	FSANZ enforces Maximum Residue Limits (MRL) for certain foodstuffs for human consumption. May affect seed viability. May affect plant growth in soil that has been fumigated. For goods limitations and further information, refer to the department's Methyl Bromide Treatment Standard.
Phosphine fumigation treatment	Fumigation using phosphine or phostoxin in the control of biosecurity risks.	FSANZ enforces Maximum Residue Limits (MRL) for certain foodstuffs. Reacts with some metals (for example copper, brass, gold and silver) so may damage electronic and electrical equipment such as computers, motors, switches and fire alarms; and photographic film or copy paper.
Physical removal	Physical removal is the physical separation of a contaminant from its original location or position. Removal is usually followed immediately by destruction of the contaminant by a department approved method.	n/a
Sodium hypochlorite (NaClO) treatment	The use of sodium hypochlorite in the control of biosecurity risks.	FSANZ limits use as a processing aid. May corrode metals.

7 Destruction

7.1 Destruction of goods

If goods have been directed for treatment, and the person in charge does not agree with the treatment, they may request permission to dispose of goods.

If the biosecurity officer suspects on reasonable grounds that the goods cannot be effectively treated to reduce the biosecurity risk to an acceptable level, the biosecurity officer may, subject to the notification and approval requirements, require the goods to be destroyed.

7.2 Destruction of high-value goods

If the goods are high-value goods—that is the value of the goods is greater than the amount prescribed in the regulation—the goods must not be destroyed without written approval of the Director of Biosecurity.

The decision to require high-value goods be destroyed is a reviewable decision. If a review is being undertaken, the goods can only be destroyed if the biosecurity officer is satisfied that the goods pose a high level of biosecurity risk and the risks cannot be managed for long enough to allow a review to be finally determined.

The requirement that the Director approve the destruction of high-value goods along with the review function reflect the monetary outlay that an owner may have invested in the good and ensures that an owner or person in charge is able to access review mechanisms to protect his or her goods.

A biosecurity officer must not cause high-value goods to be destroyed until the end of the review period, for any review of the decision to destroy the good to be completed or until an application for review (including an appeal) has been determined.

7.3 High risk goods

If the goods have been destroyed, because the biosecurity risks cannot be managed for the duration of any review or appeal, no application for review can be made and any review or related proceedings are taken to be discontinued.

7.4 Destruction methods

Destruction methods are usually administered using a third party provider at an Approved Arrangement (AA) site either under the supervision of biosecurity officers or under an AA. If an AA is not in place, department supervision is required. Destruction must take place within given timeframes.

Table 3 lists and describes the department approved methods of destruction.

Table 3 Department approved destruction methods

Treatment	Definition	Comment
Autoclaving	High-pressure sterilisation of biosecurity risks by steam.	Widely used to mitigate any biosecurity risks with the material prior to further disposal such as disposal via domestic waste systems.
Deep burial	Burial of biosecurity waste at a department approved location at a depth of greater than 2 metres.	Insects, animal and plant material may need to be treated by an approved means prior to deep burial to ensure each risk is mitigated.
Incineration	The combustion of organic substances contained in waste materials at a department approved location. Incineration of waste materials converts the waste into ash, flue gas, and heat.	Ash is mostly formed by the inorganic constituents of the waste, and may take the form of solid lumps or particulates carried by the flue gas.

8 Export

Goods with biosecurity risks that cannot be treated or destroyed by an approved method must be exported from Australia.

Goods destined for export must be separated and contained prior to export.

Export from Australia must take place within stated timeframes.

9 Live animals (vertebrates)

9.1 Definition

This includes any animal with a back bone that is alive, and unintentionally enters Australia as a hitch-hiker on imported goods or packaging arriving by sea or air.

Common live animals detected on imported goods or in containers include, but are not limited to, mammals (for example rats and mice), amphibians (for example toads and frogs), reptiles, birds and other vertebrates (for example cats and bats).

9.2 Biosecurity risks

Live animals pose a biosecurity risk to Australia because they can:

- Introduce exotic pests and/or diseases.
- Be a pest in their own right.
- Be infested with disease carrying internal parasites (such as worms, flukes).
- Be infested with disease carrying external parasites (such as ticks, mites, lice and fleas).

9.3 Evidence

Evidence indicating the presence of a live animal includes feathers, nesting material, fur or faeces.

9.4 Treatments

Table 4 lists and describes the department approved treatments for live animals.

Table 4 Department approved treatments for live animals

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction	Other
n/a	n/a	n/a	n/a	n/a	n/a	Refer to a biosecurity veterinarian or the Live Animal Imports section for humane euthanasia and disposal using a department approved method.	Refer to a biosecurity veterinarian or the Live Animal Imports section.

10 Animal material

10.1 Definition

Animal material is considered to be any dead animal and any material that originates from, or is produced by an animal. Examples of animal material commonly detected on imported goods include, hair, fur, skin, faeces, shell, blood and fluids, feathers, honey, flesh and bone.

10.2 Biosecurity risks

Animal material poses a biosecurity risk to Australia because:

- All animal parts/products can introduce pathogens that can affect animals and humans.
- Many viruses and bacteria are able to survive for long periods in animal tissue, blood and mucous.
- Some species and spores can be comparatively resistant to a variety of treatments.

10.3 Evidence

Evidence indicating the presence of animal material includes feathers, fur, faeces.

10.4 Physical removal

The contaminant must be removed and treated as biosecurity waste unless it has been treated by one of the methods in Table 5.

10.5 Treatments

Table 5 lists and describes the department approved treatments for animal material.

Table 5 Department approved treatments for animal material

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction
Applies to biosecurity risk only 121˚C, 105kPa (15psi) for 15 mins; **OR** 134˚C, 205kPa (30psi) for 4 mins.	n/a	For invertebrates and eggs that may be on animal hair when it is a contaminant 32g/$m^3$for 2 hrs at 21˚C.	50 kGray (5 Mrad).	n/a	n/a	If appropriate for the type of biosecurity risk and goods.

10.6 Cleaning treatments

All surfaces must be cleaned of visible biosecurity risks.

If import conditions state disinfection is required, all surfaces must be cleaned of visible biosecurity risks prior to application of a department approved disinfection treatment.

Any waste water generated from these treatments must be treated as biosecurity waste.

Table 6 lists and describes the department approved cleaning treatments for organic matter.

Table 6 Department approved cleaning treatments for organic matter

Cleaning under pressure	Vacuuming	Steam cleaning
Water/air under pressure.	Vacuum with a minimum capacity of 1400 watts. Contents of vacuum bag must be destroyed under biosecurity officer supervision.	Hot water under pressure.

10.7 Disinfection treatments

All surfaces must be cleaned of visible biosecurity risks prior to a disinfection treatment being applied.

Table 7 lists and describes the department approved disinfection treatments for pathogens on non-porous surfaces.

Table 7 Department approved disinfection treatments for pathogens on non-porous surfaces

Virkon
Virkon disinfectant (*active ingredient Potassium peroxymonosulphate*) Applied as per manufacturer's instructions on animal, plant and microbial goods. Sold as 1% Virkon S (Antec International) or 1% Viricidal X (Johnson Diversy)

11 Invertebrates

11.1 Definition

Invertebrates include many parasites and important vectors of disease. Invertebrates commonly detected on imported goods or containers include arthropods such as insects (for example bees, wasps, ants, termites, mosquitoes, beetles, moths, bugs and flies), crustaceans, snails, mites, spiders, millipedes and scorpions.

11.2 Biosecurity risks

Invertebrates pose a biosecurity risk to Australia because:

- The introduction of some exotic pests would have a serious adverse impact on Australia's economy and environment.
- Some exotic pests can carry and transmit disease to humans, animals and plants.
- All life stages (such as eggs and larvae) of invertebrates can also represent a biosecurity risk to plant, animals and humans.

Note: Identification by a regional biosecurity entomologist may be required to determine suitable treatment.

11.3 Evidence

Evidence indicating the presence of invertebrates includes nests, mud casings (wasps) and tunnelling (termites), wings, frass, shells or casings. In some cases, the extent or type of evidence may require the area to be treated, even in the absence of the invertebrate itself.

11.4 Categories

The categories of invertebrate pests commonly encountered include:

- Timber pests
- Stored product pests
- Flying pests
- Spiders
- Ants
- Other
- Fresh produce pests
- Hitch-hikers
- Aquatic pests
- Non-actionable pests

12 Invertebrates – timber pests

12.1 Definition

Timber pests include those invertebrates who, at some time in their life cycle, use timber as a food source. This group mainly includes termites, timber boring beetles, longicorns, borers, weevils, bark beetles, some moths, and timber boring ants and wasps.

12.2 Biosecurity risks

Timber pests pose a biosecurity risk to Australia because:

- The introduction of some exotic timber pests could cause serious structural damage to buildings and other structures using timber as a component.
- These pests can equally cause serious damage to softwood and hardwood plantation timbers in the timber industry.
- They can also impact on forest, horticultural and urban trees.

Note: Identification by a regional biosecurity entomologist may be required to determine suitable treatment.

12.3 Evidence

Evidence indicating the presence of timber pests includes mud tunnels, nests, wings, casings, holes, eggs and frass as granular pellets or powder.

12.4 Treatments – timber pests

Table 8 lists and describes the department approved treatments for timber pests.

Table 8 Department approved treatments for timber pests

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction	Other
n/a	Under vacuum of 50kPa at 1200g/m^3 for 5 hrs at 50˚C; **OR** 1500g/m^3 for 24 hrs at 21˚C.	48g/m^3 for 24 hrs at ≥21˚C at NAP; **OR** 64g/m^3 for 4 hrs at ≥21˚C under 660mm vacuum; **OR** 64g/m^3 for 5 hrs at 4-20˚C under 660mm vacuum.	10kGray (1.0Mrad)	Refer to Timber and timber mouldings BICON case; **OR** 56˚C ≥30 mins at the core.	Refer to OSS for advice on treatment options.	Usually allowed for hitch-hikers only when conditions allow.	Refer to OSS for advice on treatment options.

13 Invertebrates – stored product pests

13.1 Definition

Stored product pests are those pests found in animal or plant based stored products. This group mainly includes weevils, moths, beetles, grain borers, and meal worms.

13.2 Evidence

Evidence indicating the presence of stored product pests includes webbing, nests, wings, casings, holes, eggs and frass as granular pellets or powder.

13.3 Treatments – stored product pests

Table 9 lists and describes the department approved treatments for stored product pests.

Table 9 Department approved treatments for stored product pests

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction	Other
n/a	n/a	**Khapra beetle** 80g/m^3 for 48 hrs at ≥21˚C at NAP with an end point concentration of 20g/m^3.	n/a	n/a	n/a	n/a	Refer to OSS for advice on treatment options.
n/a	n/a	**Other stored product pests** 32g/m^3 for 24 hrs at ≥21˚C at NAP; **OR** 40g/m^3 for 2 hrs at ≥21˚C under 660mm vacuum. Refer to OSS for treatment options to treat insects in seeds for sowing.	n/a	n/a	-18 ˚C for min 7 days.	n/a	**Phosphine fumigation treatment** 1.0-1.5g/m^3 for 10 days at 15˚C-25˚C; **OR** 1.0-1.5g/m^3 for 7 days at ≥25˚C.

14 Invertebrates – other

Imported goods infested with actionable live insects will require immediate action/ treatment (in most cases, fumigation), in consultation with the regional biosecurity entomologist.

Importers may be provided with the option for identification of the insect(s) prior to treatment, while the container remains on hold.

If the insects are highly mobile, (for example bees and ants) contact the regional biosecurity entomologist for advice whether a more urgent treatment or special containment measures are required.

If the goods are refrigerated, hazardous or the goods have other factors that may affect fumigation contact the regional biosecurity entomologist for treatment options.

If the insects are determined to be of no biosecurity risk, the goods or container may be released from biosecurity control or proceed on to the next AIMS direction.

14.1 Invertebrates – flying pests

Flying pests usually include bees and/or wasps swarming around a nest attached to a container or goods. Evidence indicating the presence of flying pests usually includes the nest itself, insects flying around the nest, dead insects under the nest, honey or other product under the nest. Refer to your regional office for advice on treatment options.

14.2 Invertebrates – spiders

Spiders on imported goods usually include non-ground dwelling actionable pests like black widow spiders, or non-actionable pests like daddy-long-legs. Evidence indicating the presence of spiders includes webbing, nests and silk strands. Refer to your regional office for advice on treatment options.

14.3 Invertebrates – ants

Ants detected on imported goods usually include those in a nest, those feeding on a food source, or those found as hitch-hiker pests. Evidence indicating the presence of ants includes frass or dirt around the site of a nest. Refer to your regional office for advice on treatment options.

14.4 Invertebrates – fresh produce pests

Refer to your regional office for advice on treatment options.

14.5 Invertebrates – hitch-hikers

Refer to your regional office for advice on treatment options.

14.6 Invertebrates – aquatic

Refer to your regional office for advice on treatment options.

14.7 Invertebrates – non-actionable

Non-actionable pests are those species who do not pose a biosecurity risk.

Usually no action is required; however, if these pests occur in high numbers, their presence may mask the presence of exotic pests and/or be indicative of poor sanitary or biosecurity measures. In these cases, refer to your regional office for advice on treatment options.

15 Snails and slugs

15.1 Definition

There are many species of snails and slugs exotic to Australia, the most significant being the giant African snail (GAS).

15.2 Biosecurity risks

Snails and slugs pose a biosecurity risk to Australia because:

- Snails and slugs are destructive invertebrates that eat various plant materials and can also carry parasites and pathogens.
- GAS is considered to be the most damaging land snail because it can consume over 500 varieties of plants.
- GAS can also carry human diseases, and has the ability to reproduce in large numbers very quickly.
- Snails can aestivate (become dormant) and emerge when weather conditions are more favourable.
- Snails can carry the rat lungworm parasite *Angiostrongylus cantonensis*, which can infect humans and cause meningitis.

15.3 Evidence

Evidence indicating the presence of snails and slugs includes shells, eggs and trail marks.

15.4 Treatments

Table 10 lists and describes the department approved treatments for slugs and snails. Note: Follow up inspection is required post-treatment.

Table 10 Department approved treatments for slugs and snails

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction	Other
n/a	n/a	**GAS** 128g/m^3 for 24 hrs at ≥21˚C at NAP; **OR** Refer to OSS for advice on treatment options. **Non-GAS snails/slugs** Refer to OSS for advice on treatment options. **Snails/slugs on nursery stock or cut flowers** Refer to OSS for advice on treatment options.	n/a	n/a	n/a	If appropriate for the type of biosecurity risk and goods. Only allowed in this case if officers are wearing gloves.	Washing of containers is an option under certain conditions. For any other situations, refer to OSS for advice on treatment options.

16 Plant pathogens

16.1 Definition

Plant pathogens include fungi, bacteria, viruses and various other micro-organisms that can infect plant parts from the roots to the leaves, fruit, seeds and even pollen. Timber can also be infected by fungal pathogens such as wood rotting and sap staining fungi.

16.2 Biosecurity risks

Plant pathogens pose a biosecurity risk to Australia because:

- Australia is relatively free from most of the world's serious pathogens.
- Exotic fungi, bacteria and viruses entering and establishing in Australia could severely affect Australia's environment, horticultural, agricultural and forest industries and urban landscapes.
- Many pathogens cause severe crop losses and reduce or prevent fruit and vegetable production.

16.3 Evidence

While the pathogen itself may not always be visible, signs of infection include spots/lesions, colour mottling, distorted growth, stunted plants etc.

16.4 Treatments

Table 11 lists and describes the department approved treatments for plant pathogens. Note: Verification by a biosecurity plant pathologist is required to determine suitable treatment.

Table 11 Department approved treatments for plant pathogens

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal
121˚C 105kPa (15psi) for 15 min; **OR** 134˚C 205kPa (31psi) for 4 min.	Under vacuum of 50kPa at 1200g/m^3 for 5 hrs at 50˚C; **OR** 1500g/m^3 for 24 hrs at 21˚C.	n/a	For items of plant origin 25kGray (2.5Mrad).	Core temperature 85˚C ≥8 hrs.	n/a	n/a

17 Plant material (excl. seed and bark) – live, reproductive, fresh, dry

17.1 Definition

Plant material includes material that originates from, or is produced by a plant, such as pollen, spores, flowers, pods, gum, leaves, branches, roots, stems, wood chips, straw, wood, fruit and fruit pulp.

17.2 Biosecurity risks

Plant material poses a biosecurity risk to Australia because:

- Fresh material could introduce exotic plant diseases, insects and snails.
- Dried plant material may be infested with insects and plant diseases.
- Soil may adhere to plant parts which can also harbour exotic pests (both plant and animal).

17.3 Physical removal

The contaminant must be removed, and must be treated as biosecurity waste unless it has been treated by one of the methods in Table 12.

17.4 Treatments

Table 12 lists and describes the department approved treatments for plant material.

Table 12 Department approved treatments for plant material

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction
121˚C 105kPa (15psi) for 15 min; **OR** 134˚C 205kPa (31psi) for 4 min.	Under vacuum of 50kPa at 1200g/m^3 for 5 hrs at 50˚C; **OR** 1500g/m^3 for 24 hrs at 21˚C.	n/a	25kGray (2.5Mrad)	Core temperature 85˚C ≥8 hrs	n/a	If appropriate for the type of biosecurity risk and goods.

17.5 Cleaning treatments

All surfaces must be cleaned of visible biosecurity risks.

Any waste water generated from these treatments must be treated as biosecurity waste.

If detected in a container, reinspect the container after cleaning to confirm it is free from biosecurity risk.

Table 13 describes the department approved cleaning treatments to remove organic matter.

Table 13 Department approved cleaning treatments for organic matter

Cleaning under pressure	Vacuuming	Steam cleaning
Water/air under pressure.	Vacuum with a minimum capacity of 1400 watts. Contents of vacuum bag must be destroyed under biosecurity officer supervision.	Hot water under pressure.

17.6 Disinfection treatments

All surfaces must be cleaned of visible biosecurity risks.

If import conditions state disinfection is required, all surfaces must be cleaned of visible biosecurity risks prior to application of a department approved disinfection treatment.

Table 14 lists and describes the department approved disinfection methods for pathogens on non-porous surfaces.

Table 14 Department approved disinfection methods for pathogens on non-porous surfaces

Virkon
Virkon disinfectant (*active ingredient Potassium peroxymonosulphate*) Applied as per manufacturer's instructions on animal, plant and microbial goods. Sold as 1% Virkon S (Antec International) or 1% Viricidal X (Johnson Diversy)

18 Bark

18.1 Definition

Bark is the natural outer protective layer of stems and roots of woody plants. Plants with bark include trees, woody vines and shrubs. Bark refers to all the tissues outside the vascular cambium. This material is distinct and separable from processed timber.

18.2 Biosecurity risks

Bark poses a biosecurity risk to Australia because it can harbour:

- Invertebrates such as bark beetles that feed just under the bark of trees.
- Plant pathogens including fruiting structures of fungal pathogens. For example bracket fungi fruit through bark and *Ophiostoma* sp. fruit under bark.
- Biosecurity risks from the environment in its structure, for example resistant spores like rusts and smuts, or seeds may be present in the cracks and crevices of bark.

18.3 Tolerances

The department requires all solid timber packaging and dunnage to meet the bark requirements as defined in the International Standard for Phytosanitary Measures No. 15 (ISPM15) – Regulation of Wood Packaging Material in International Trade.

This standard requires solid timber packaging and dunnage material to be free of bark, however does allow for a tolerance for small pieces of bark that have not been completely removed during milling.

Please note that the department maintains its bark freedom requirement for timber imported as goods. Only ingrown bark around knots and bark pockets between rings of annual growth are acceptable for goods timber.

18.4 Treatments

Table 15 lists and describes the department approved treatments for bark in excess of stated tolerances.

Table 15 Department approved treatments for bark in excess of stated tolerances

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction	Other
n/a	Under vacuum of 50kPa at 1200g/m^3 for 5 hrs at 50˚C; **OR** Under vacuum of 50kPa at 1500g/m^3 for 24 hrs at 21˚C.	n/a	25kGray (2.5Mrad).	Core temperature 85˚C ≥8 hrs.	n/a	If appropriate for the type of biosecurity risk and goods. Immediate removal is usually followed by destruction of the bark using a department approved method.	Refer to OSS for advice on treatment options.

19 Seeds

19.1 Definition

A seed is a propagating organ formed in the sexual reproductive cycle of plants, consisting of a protective coat enclosing an embryo and food reserves.

19.2 Biosecurity risks

Seeds pose a biosecurity risk to Australia because they have the potential to harbour risk material such as:

- Other viable seeds that may be prohibited or restricted entry into Australia.
- Insect infestations.
- Soil, which also may harbour plant and animal pathogens, nematodes and/or invertebrates.
- Plant pathogens (fungi, bacteria, viruses, nematodes) both externally or internally and, in some cases, the infection may not be evident until the plant matures.

19.3 Treatments for biosecurity risks found in seeds

Table 16 lists and describes the department approved treatments for seeds as per the following key:

1) Treatments for seed contaminated with soil are marked '1' in the table header below.
2) Treatments for seed with insect infestation/s are marked '2' in the table header below.
3) Treatments for seed contaminated with plant pathogens are marked '3' in the table header below.
4) Treatments for seed contaminated with other viable seeds are marked '4' in the table header below.

Note: Some treatments for the contaminant, may affect the viability of the seed.

Table 16 Department approved treatments for seeds

[1,3] **Autoclave**	[2] **Ethylene oxide fumigation**	**Methyl bromide fumigation**	[1,2,3] **Gamma irradiation**	[1,3] **Heat**	**Cold**	[4] **Physical removal and destruction**
121˚C 105kPa (15psi) for 15 min; **OR** 134˚C 205kPa (31psi) for 4 min.	Under vacuum of 50kPa at 1200g/m^3 for 5 hrs at 50˚C **OR** 1500g/m^3 for 24 hrs at 21˚C.	n/a	25kGray (2.5Mrad)	Core temperature 85˚C ≥48 hrs (50% relative humidity); **OR** Core temperature 95˚C ≥24hrs (50% relative humidity).	n/a	If appropriate for the type of biosecurity risk and goods. Immediate removal is usually followed by destruction using a department approved method.

19.4 Treatments for seeds as a contaminant

If seeds are present on goods such as ornaments, the goods may be treated using one of the methods in Table 16 Department approved treatments for seeds although consideration needs to be given to possible damage to the product. Refer to plant biosecurity for assessment on a case by case basis.

19.5 Cleaning treatments

If cleaning is an option, all surfaces must be cleaned of visible biosecurity risks as per below. If import conditions state disinfection is required, all surfaces must be cleaned of visible biosecurity risks prior to application of a department approved disinfection treatment.

Any waste water generated from these treatments must be treated as biosecurity waste.

Table 17 lists and describes the department approved cleaning treatments to remove organic matter.

Table 17 Department approved cleaning treatments for organic matter

Cleaning under pressure	Vacuuming	Steam cleaning
Water/air under pressure	Vacuum with a minimum capacity of 1400 watts. Contents of vacuum bag must be destroyed under biosecurity officer supervision.	Hot water under pressure.

20 Soil

20.1 Definition

Soil is a natural unconsolidated or loose covering of fine rock particles that covers the surface of the earth.

20.2 Biosecurity risks

Soil and related material pose a biosecurity risk to Australia because they have the potential to harbour risk material such as:

- Plant material for example weed seeds.
- Animal waste for example faeces and fluids.
- Animal diseases for example anthrax and foot and mouth disease.
- Plant pathogens for example fungi, bacteria, viruses and nematodes.
- Plant pests for example insects, mites and snails.

20.3 Treatments

Table 18 lists and describes the department approved treatments for organic matter.

Table 18 Department approved treatments for organic matter

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction	Other
Biosecurity risk only 121˚C, 105kPa (15psi) for 15 mins; **OR** 134˚C, 205kPa (30psi) for 4 mins.	n/a	n/a	50kGray (5 Mrad)	n/a	n/a	If appropriate for the type of biosecurity risk and goods. Immediate removal is usually followed by destruction using a department approved method.	Refer to OSS and assess on a case by case basis.

20.4 Physical removal

The contaminant must be removed, and must be treated as biosecurity waste unless it has been treated by one of the methods in Table 18.

All surfaces must be cleaned of visible biosecurity risks as per the cleaning treatments in Table 19.

20.5 Cleaning treatments

If cleaning is an option, all surfaces must be cleaned of visible biosecurity risks as per below. If import conditions state disinfection is required, all surfaces must be cleaned of visible biosecurity risks prior to application of a department approved disinfection treatment.

Any waste water generated from these treatments must be treated as biosecurity waste.

Table 19 lists and describes the department approved cleaning treatments to remove organic matter.

Table 19 Department approved cleaning treatments to remove organic matter

Cleaning under pressure	Vacuuming	Steam cleaning
Water/air under pressure	Vacuum with a minimum capacity of 1400 watts. Contents of vacuum bag must be destroyed under biosecurity officer supervision.	Hot water under pressure.

21 Water

21.1 Definition

Water is a transparent, odourless, tasteless liquid. It is a compound of hydrogen and oxygen that in a more or less impure state constitutes rain, oceans, lakes and rivers.

21.2 Biosecurity risks

Water poses a biosecurity risk to Australia because it has the potential to harbour risks such as:

- Seeds.
- Plant, human and animal pathogens.
- Many micro-organisms including those that cause water borne diseases.
- Providing a pathway for vectors to introduce disease especially mosquito life stages. For example the Asian tiger mosquito, *Aedes albopictus,* can carry several exotic infectious viruses that affect both animals and humans.

21.3 Evidence

Water marks are evidence that water has been present.

21.4 Treatments – water only

Table 20 lists and describes the department approved treatments for water.

Table 20 Department approved treatments for water

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction	Other
121˚C, 105kPa (15psi) for 15 mins; **OR** 134˚C, 205kPa (31psi) for 4 mins.	n/a	n/a	50kGray (5 Mrad)	Boiling at 100˚C for 30 minutes	n/a	n/a	**Chlorine treatment** 3300 ppm = 10 teaspoons (50g) chlorine (650g/kg calcium hypochlorite) per 10 litres water. Ensure nil organic material present; **OR** Refer to OSS for advice on treatment options.

22 Further information

For further information about treatment options please contact Imports:

- Phone: 1800 900 090
- Email: Imports

23 Related material

- Biosecurity Act 2015 and subordinate legislation
- Biosecurity Import Conditions (BICON) system
- Plant Pest and Diseases (incl. Forestry and Timber)
- Plant Health Australia – Exotic Plant Pest Hotline
- National Pests and Disease Outbreaks
- Northern Australia Quarantine Strategy
- Forests and Timber: A Field Guide to Exotic Pests and Diseases
- Wood Packaging Material (Technical Justification Report)
- World Organisation for Animal Health - OIE

24 Version history

Version	Date published	Reason for issue or amendment	Section
1.0	September 2009	Available treatment options for staff and importers when risk material is detected in a consignment.	Plant Biosecurity Operations
2.0	September 2011	Update to plant pathogen treatment.	Air and Sea Cargo Program
3.0	June 2013	Updates to content and formatting following review.	Air and Sea Cargo Program
4.0	September 2015	Update to rebrand and include information from the 'Detection of QRM' work instruction.	Cargo and Mail Section
5.0	June 2016	Update to reflect biosecurity legislation changes.	Cargo and Mail Section
6.0	April 2017	Formatting update	Cargo and Mail Section
7.0	September 2022	Update to rebrand and treatment guide	Sea Cargo Section

COPPERSTRING 2032

COPPERSTRING 2032 JV

REGULATORY APPROVALS PLAN

COPPERSTRING 2032

EDMS No : CSPW-EVN-PLN-900-000014
Revision : A02
Date : 14/06/2024

IFR

Approvals and Reviews

Regulatory Approvals Plan

Project	CopperString 2032
Client	Powerlink Queensland Pty Ltd
Document Number	CSPW-EVN-PLN-900-000014

Revision History

Rev No.	Description of Revision	By	Checked	Approved	Date
A01	Developed for PDLA Work Contract	David McLean	Micheal Dawson	Matt Lennon	03/05/2024
A02	Updated incorporating PQ comments on 30/05/2024	David McLean	Jacinta Fuller	Matt Lennon	14/06/2024

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Appendices

Appendix A Approvals Matrix

Appendix B Approvals Register Template

1. Introduction

The purpose of the CopperString 2032 project is to connect the North West Minerals Province (NWMP) of Queensland to the National Electricity Grid. This will not only allow existing loads in the Mount Isa and Cloncurry areas to be fed from the National Electricity Market (NEM), but also provide access to new mining loads and opportunity for connection of renewable generation.

1.1 Project scope

The CopperString 2032 Project is an extra high voltage transmission system intended to connect the North West Power System (NWPS) near Cloncurry and Mount Isa to the Powerlink network and NEM at Mulgrave. Figure 1 provides an overview of the Project.



Figure 1 CopperString 2032 proposed transmission lines and substations

The CopperString 2032 Project will connect the NWMP to the NEM to reduce the cost of power supply and facilitate the large-scale development of the Hughenden wind resource and solar resources within the North Queensland Clean Energy Hub (NQCEH).

The scope of work, traversing east to west, consists of the following sections:

- Mulgrave 500/275kV Substation as the CopperString 500kV connection point to the Queensland Super Grid and 275kV line augmentation as the CopperString 275kV connection point to the NEM
- Pentland 500kV Substation to support the North Queensland Clean Energy Hub (NQCEH) expansion and as the core for future load connections in the area
- Flinders 500/300kV Substation (Hughenden) as the core for the NQCEH
- Dajarra Road 330/220kV Substation (Cloncurry) as the core for distributions to larger load centres
- The primary CopperString transmission backbone
- Termination via the Mount Isa augmentation 220/132kV.

The scope consists of a transmission line between the above locations carrying extra high voltage power transmission at 500kV, 330kV and 220kV respectively. Substations at the abovementioned interconnecting junctions will distribute power to the NWMP and NQCEH.

2. Purpose

This CopperString 2032 Regulatory Approvals Plan (RegAP) has been prepared as part of the main works Construction Environmental Management Framework (EMF).
The purpose of this RegAP is to:

- Identify regulatory approvals required for the CopperString 2032 project during design and construction including responsibilities between the Proponent (Client: Powerlink Queensland) and the construction UGL and CPB Joint Venture (JV)
- Develop an approval strategy to support the project program
- Implement a coordinated approach to obtaining approvals.

The issue of this RegAP supersedes the Regulatory Approvals Plan in Appendix L of the Copperstring 2032 Environmental Impact Statement (EIS).

This RegAP has been prepared having regard to the Approvals and Compliance Matrix (Powerlink). PQ are currently updating the approvals strategy and have advised UGLCPB JV that approvals clarity will be provided for the project roles and responsibilities moving forward.

This RegAP includes:

- Approval pathway mapping for primary approvals with respect to EMF scope and secondary approvals triggers in **Appendix A**
- Approvals Matrix in **Appendix B**, as per Section 5.5, which identifies all approval triggers, administering authorities and assessment timeframes, for purposes of scheduling, with respect to the key primary approvals (EIS Change Report and MID applications) and secondary approvals included herein
- Cross reference to a proposed Approvals (Compliance) Register in Appendix C that will track approval submissions and conditions, as per Section 5.7 and updated in Section 5.10.

3. Scope

This RegAP has been prepared to identify the regulatory (environmental-focused) approvals pursuant to legislation that is applicable to the CopperString 2032 project scope. The project scope currently generally includes:

- Clearing vegetation and earthworks for a transmission line and ancillary infrastructure (eg. off-easement access tracks and water sources) involving:
  - Matters of National Environmental Significance triggers
  - Matters of State Environmental Significance triggers
  - Interfering with protected species (flora and fauna) and
  - Works within Native Title claimed areas
  - Land affected by Unexploded Ordnance (UXO)
- Constructing and operating accommodation hubs with facilities including:
  - Clearing regulated vegetation
  - Works within Native Title claimed areas
  - Accommodation units and offices, and carparking (involving building and plumbing and drainage works)
  - Mains connection (power, water and sewerage)
  - Mobile and temporary concrete batching plants
  - Motor vehicle workshop
  - Fuel (chemical) storage (up to 50,000L of Class 1 dangerous goods)
  - Water treatment, for provision of drinking water

  - Wastewater (sewage) treatment
  - Biosecurity washdown bays
- Taking water (surface and groundwater)
- Use of quarry material from commercial sources, although project specific borrow pits may be identified as an opportunity
- Crossing mapped waterways for access
- Crossing mapped watercourses for access
- Upgrading public roads
- Working within and adjacent to rail corridors
- Disposing of contaminated soil (if found within properties listed on the Environmental Management Register (EMR)).

This RegAP does not apply to early works site investigations scopes which are addressed in the Early Works Construction Environmental Management Plan (EW CEMP) (0643-JV-PLN-CMP-0035).

This RegAP does not address:

- Land easements
- Land acquisition (including lease agreements for accommodation hubs)
- Construction safety related licences and permits under UGL's safety management system
- Licencing for mains connection not associated with building/pluming and drainage works
- Operations and maintenance of the transmission line
- Air safety eg. CASA licencing. The project alignment through stage 4 is still to be finalised for the project and as such the need or otherwise for this approval is still to be finailised.
- Native Title approvals
- Route or vehicle class specific licencing under road safety laws.

This RegAP assumes:

- All pre-clearance (6 month in advance) ecological and cultural heritage requirements are completed by the Client.
- All ancillary infrastructure off-easement has been identified in the approval applications (for construction to be undertaken generally in accordance with).

4. Primary Approvals

4.1 Approvals strategy

The project proposes the following approval strategy for obtaining primary approvals.

- Identified the project as State Significant pursuant to the State Development and Public Works Organisation Act 1971 (SDPWO Act). An EIS was developed and a report from the Office of the Coordinator General issued to the project for approval under the Planning legislation (e.g. through a MID or similar approval process).

  Under this process, the State of Queensland has a bilateral agreement to address Matters of National Environmental Significance (MNES) pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999).
- Seeking Ministerial Infrastructure Designation (MID) for the project inclusive of the transmission line, substations, and stage 3 & 4 accommodation hubs. This is managed pursuant to the *Planning Act 2016* and administered by the Department of State Development, Infrastructure, Local Government and Planning (SDILGP).

- Stage 1 & 2 accommodation hubs (Hughenden, Richmond, and Julia Creek) for the project shall be covered under the Works Regulation. This is managed pursuant to the Planning Act 2016 and the *State Development and Public Works Organisation Act 1971.*

The MID approval strategy has been separated into key project components consistent with program planning.

Obtaining primary approvals is the responsibility of Powerlink Queensland.

4.1.1 Primary Approvals

The primary approvals have been identified as follows. The MID approval schedule is being maintained by Powerlink Queensland.

In addition to the primary approvals listed in Table 1, Powerlink Queensland have sought agreed Cultural Heritage Management Plans (CHMPs) with the relevant Aboriginal Party(ies) that are, by interpretation, deemed a primary approval.

Note the primary approvals scope and staging is currently evolving as the JV collaborates with Powerlink Queensland on requirements to inform design and manage construction. This will be ongoing and the CEMP process will be required to be adaptive in response to the strategy and conditions of approval. A review of the pathway to project commencement with respect to the approvals and environmental management requirements has been drafted. **Refer to Appendix A**.

Table 1 CopperString 2032 Primary Approvals

Primary Approval	Applicable scope	Relevant legislation	Status
EIS Coordinator General's Report on the project (CoG Report) including: Appendix 1 – Imposed conditions Appendix 2-5 – Recommended conditions (to be adopted during the MID process)	Whole of project	*SDPWO Act*	Approved with conditions (refer to the CoG Report)
EPBC 2019/8416 Decision (refer Fig 1-4)	Whole of project	*EPBC Act*	Approved with conditions (Administrative change is currently being pursued as the camp locations have not all been finalised)
New referrals for stage 3 and stage 4 are currently being developed for submission to DCCEEW	Stage 3 and Stage 4	*EPBC Act*	To be submitted
Works Regulation– Camps, Julia Creek, Richmond and Hughenden. (refer Fig 1)	Accommodation hubs x3	*Planning Act 2016 & SDPWO Act*	Submitted
MID #1– Transmission Line, Stage 1 (refer Fig 2 and Fig 3)	Easement works from Cloncurry to Hughenden(Flinders Substation to Dajara substation, 340 km of 330kV transmission line)	*Planning Act 2016*	Yet to be submitted

Primary Approval	Applicable scope	Relevant legislation	Status
MID #2– Transmission Line, Stage 2 incorporating (refer Fig 2 and Fig 3)	Easement works from Cloncurry to Hughenden (Flinders Substation to Dajara substation, 340 km of 330kV transmission line)	*Planning Act 2016*	Yet to be submitted
MID #3– Transmission Line, Stage 3 (refer Fig 4)	Easement works from Cloncurry to Julia Creek	*Planning Act 2016*	Yet to be submitted
MID #4– Transmission Line, Stage 4 (refer Fig 4)	Easement works from Richmond to Hughenden	*Planning Act 2016*	Yet to be submitted
Cultural Heritage Management Plans	Whole of project	*Aboriginal Cultural Heritage Act 2003* (ACH Act)	Available: • Birriah People • Jangga People #2 • Yirendali People Core Country Claim • Wanamara People Core Country Claim • Mitakoodi People #3 • Mitakoodi People #5 • Kalkadoon People #4 • Yulluna People • Gudjal People
Other approvals to be finalised for the project			
High Impact Earthworks > 1000m3 in a Wetland Protection Area (of the GBRMPA)	The corridor selection intersects the trigger area for the HES wetland (being the wetland protection area) for a distance of approx 700m.	Schedule 7, Item 9 *Planning Regulations 2017*, section 186(3) Environmental Protection Regulation.	Unknown, to be confirmed as required based on final design for Stage 4.
Clearing Native Vegetation – Exemption Certificate	All clearing works on freehold and non-freehold land	*Vegetation Management Act 1999*	Unknown

4.1.2 Secondary approvals

The approach for secondary approvals for the project is summarised in figures 2 to 5 below. These are the approaches as determined at the time. Of note these may change dependent on the approach from PQ. PQ are currently updating the approvals strategy and have advised UGLCPB JV that approvals clarity will be provided for the project. Access tracks outside of the assessment corridor and the approval process related to these are being finalised for the project and will be included in a subsequent update.

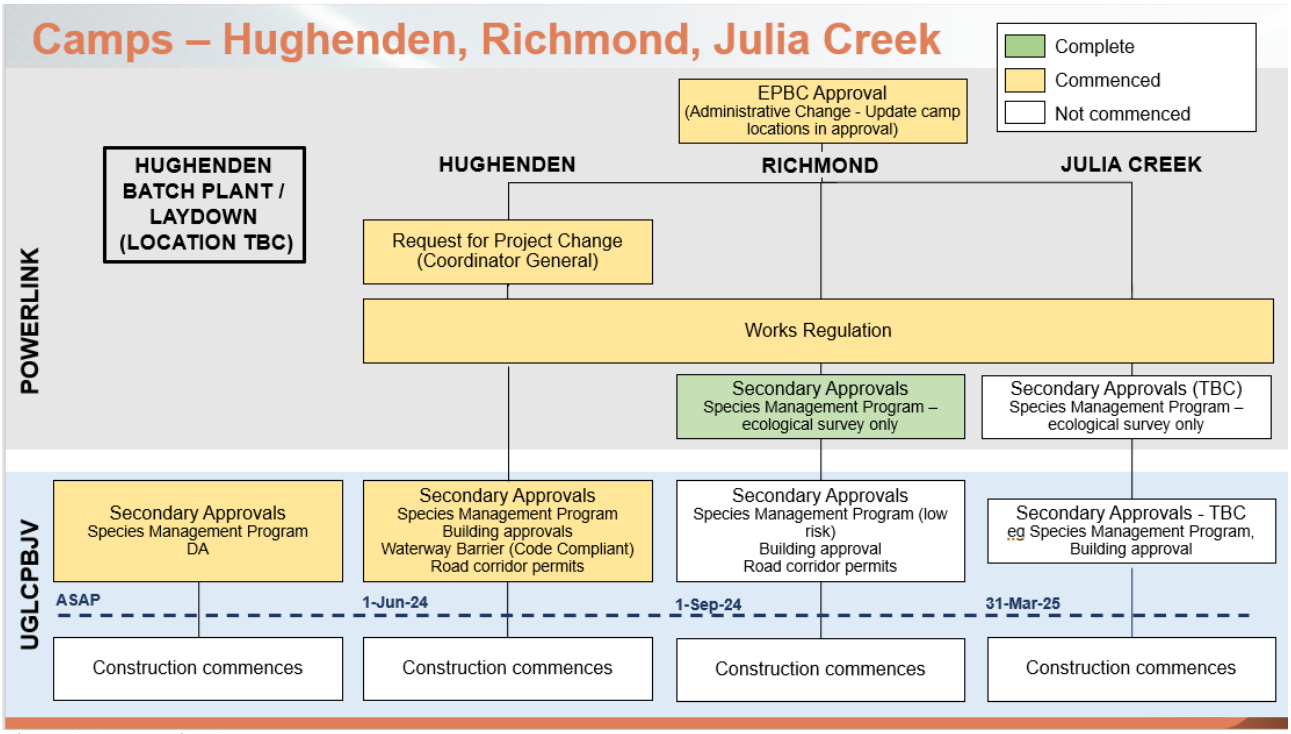

Figure 2 Construction Camps

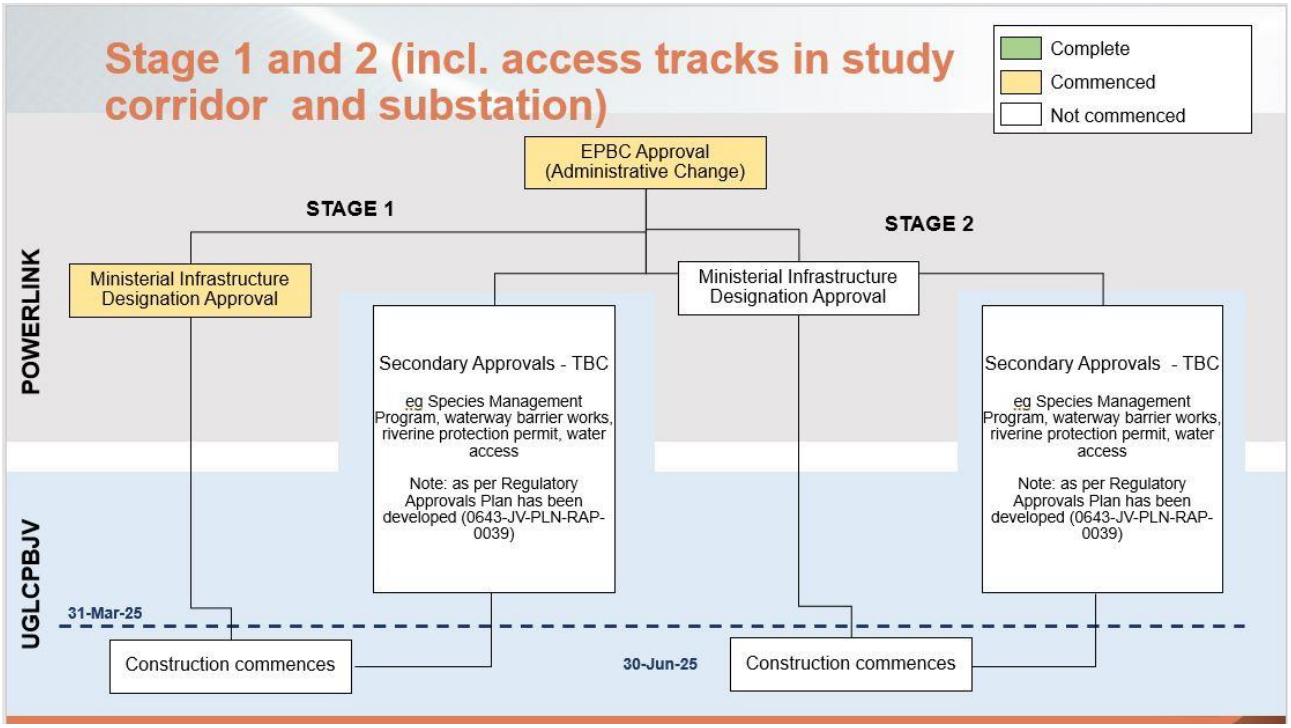

Figure 3 Stage 1 and Stage 2

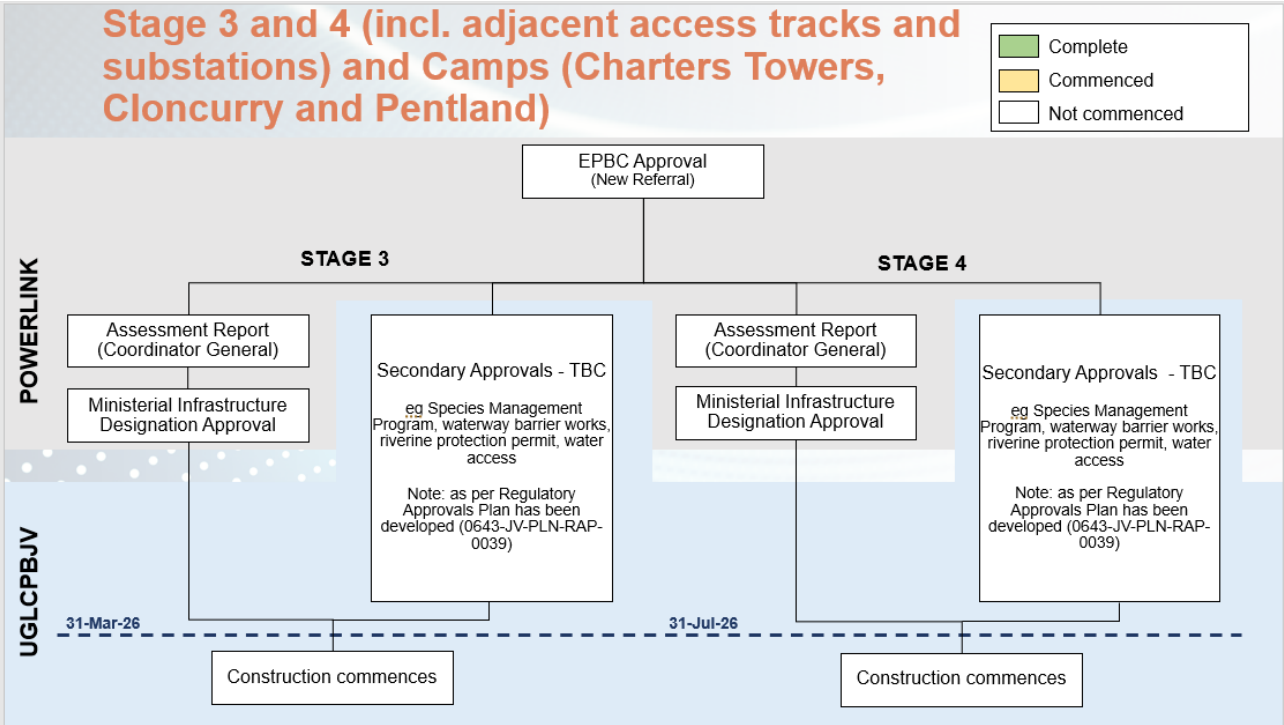

Figure 3 Stages 3 and 4

4.1.3 Local Government

Table 2 and Table 4 provides details of the local government areas across the alignment and the current approach related to work across these areas. Council areas are engaged through the conditions of approval and the administration of the compliance requirements under the approval for the project.

Table 2 Staging and LGA intersects

Approval	LGA
Works Regulation - Accommodation hubs x 3	• Flinders Shire Council (Hughenden) • Richmond Shire Council (Richmond) • McKinlay Shire Council (Julia Creek)
Mid 1 – Transmission line, Site access and substation, Stage 1	• Flinders Shire Council • Richmond Shire Council • McKinlay Shire Council
Mid 2 – Transmission line, Site access, Workers Accommodation Facility and substation, Stage 2	• McKinlay Shire Council • Cloncurry Shire Council
Mid 3 – Transmission Line, Workers Accommodation Facility and substation, Stage 3 (new referral)	• McKinlay Shire Council • Cloncurry Shire Council • Mount Isa City Council
Mid 4 – Transmission Line, Workers Accommodation Facility and substation, Stage 4 (new referral)	• Flinders Shire Council • Burdekin Shire Council • Charters Towers Regional Council

4.1.4 JV Inputs

The JV has been engaged under early works scope to provide technical input for obtaining approvals (e.g. RFPC , Conditions compliance, construction and disturbance footprints, flood modelling and other requirements) including:

- Accommodation hub design (addressing environmental aspects of bushfire, noise and vibration, stormwater, air, waste)
- Undertaking traffic impact assessments
- Undertaking flood modelling (on easement)
- Developing Road User Management Plans
- Assessing rail safety
- Field investigations (geotechnical and UXO) to inform transmission and substation design elements.

In addition, due to the potential program risk, the early works scope includes waterway assessments to inform crossing designs to accelerate the required secondary approvals to avoid any program delays. Refer to Section 4.

The technical inputs as per the early works scope will seek to satisfy relevant town planning scheme requirements (refer to Table 3 for links to references).

4.2 Amendments

The project since the CoG Report and EPBC decision have been issued has undergone a scope change for a 500KV upgrade and has additional definition on ancillary activities.

Powerlink Queensland (PQ) are currently preparing/submitting a CoG request for project change application to evaluate the impacts of the proposed change from the original decision. This is required prior to any MID applications being submitted.

If approved, this may result in a revised CoG Report and where appropriate a revised EPBC decision.

4.3 Consistency assessment

The JV will design and construct the project generally in accordance with the assessment provisions of the EIS and comply with primary approval conditions. To ensure this outcome, the JV has:

- Developed a CoG condition cross referencing matrix to identify where conditions have been addressed in plans
- Proposed an Environmental Constraints Assessment (ECA) process during detailed design
- Adopted an adaptive work planning approach that identifies relevant requirements and compliance solutions pre works and records these in work packs for execution (refer to the Project CEMP for details)
- Implemented a detailed assurance program
- drafted a compliance matrix which will progressively be updated to track compliance with conditions of approvals.

5. Secondary Approvals

Secondary approvals have been identified by the JV as required to support construction activities, that are not addressed through the MID process.
Secondary approvals are documented below, as known, as per the CEMP Appendix D. These are the aproaches as determined at the time. Of note these may change dependent on the approach from PQ . PQ are currently updating the approvals strategy and have advised UGLCPB JV that approvals clarity will be provided for the project. The JV is responsible for obtaining secondary approvals. For each secondary approval, refer to relevant subsections.

Table 3 CopperString 2032 Secondary Approvals

Secondary Approval	Applicable scope	Relevant legislation	Status
Operational Works – Clearing regulated vegetation (Section 4.1)	Off-easement clearing (if not subject to MID or exempt works). Note Access tracks are included in MID submission.	*Planning Act 2016* (subject to Section 23	Not yet started
Operational Works - Waterway Barrier Works* (Section 4.2)	Crossing mapped waterways unless can comply with Accepted development requirements for operational work that is constructing or raising waterway barrier works (Queensland Government, dated 1st October 2018) (ADR)	*Fisheries Act 1994* (Fisheries Act)	Early works scope to identify requirements
Water Entitlement (and operational works) (Section 4.3)	Construction water sources unless can comply with OSW/2020/5467 Exemption requirements for constructing authorities for the take of water without a water entitlement (Version 4.01 dated 05/02/2021)	*Water Act 2000* (Water Act)	Not yet started
Riverine Protection Permit (Section 4.4)	Crossing mapped watercourses not exempt in accordance WSS/2013/726 Riverine Protection Permit exemption guidelines (Version 2.03 dated 02/06/2023)	Water Act	Not yet started
Road Corridor Permits (Section 4.5)	Working within State/local controlled road reserve based on traffic studies and road design	*Transport Infrastructure Act 1994* (TIA)	Not yet started
Operational works – Working in a State Controlled Corridor (Section 4.6)	Working within/adjacent to railway corridor (if not subject to MID or exempt works)	TIA	Early works scope to identify requirements
Sales Permit (Section 4.7)	If borrow pits are proposed and depending on land tenure, quarry material meets the definition of a state resource.	Forestry Act 1949 (Forestry Act)	Not yet started
Species Management Program (high risk) (Section 4.8)	For interfering with wildlife (animal breeding places) of protected species.	*Nature Conservation Act 1992 (NC Act)*	Not yet started
Protected Plants clearing permit (Section 4.9)	For where clearing occurs in a protected plant mapped area (including buffer). 2 locations identified within protected plants buffer zones.	NC Act	Not yet started
Rehabilitation Permit (spotter catcher activities) (Section 4.10)	For handling wildlife as a Fauna Spotter Catcher.	NC Act	Subcontractor requirement
Environmental Licences (including Registration Certificate) (Section 4.11)	Environmentally relevant activities at accommodation hubs including but not limited to: • Water treatment • Wastewater (sewage) treatment • Fuel storage • Concrete batching • Regulated waste transport (unless code compliant or devolved to be held by a subcontractor).	Environmental Protection Act 1994 (EP Act)	Not yet started
(Contaminated land) Spoil Disposal Permit (Section 4.12)	Contaminated land confirmed via testing on EMR listed site requires offsite disposal.	EP Act	Early works scope to identify requirements

Secondary Approval	Applicable scope	Relevant legislation	Status
UXO assessment notice (Section 4.13)	UXO treatment if confirmed as present.	EP Act (on behalf of Defence)	Early works scope to identify requirements
Water Service Provider (Section 4.14)	For drinking water supply if not exempt provider	Water Supply (Safety and Reliability) Act 2008 (WSSR)	Not yet started
Building works (Section 4.15)	For accommodation hub structures that meet building classes	Building Act 1975 (Building Act)	Not yet started
Plumbing and drainage works (Section 4.16)	For building works that meet plumbing/drainage requirements	Drainage Act 2018	Not yet started
Working within a stock route (Section 4.17)	For works in a mapped stock route.	Local Government Stock Route Management Act 2002	Not yet started
Amendments to: CoG Report MID EPBC Decision (Section 4.18) (JV to support PQ in the need or otherwise for an amendment)	• For where CoG Report conditions (Appendix 1 and Appendix 3 and 5) will not be met and deviation is proposed. • For where MID conditions will not be met and deviation is proposed. • For where EPBC conditions will not met and deviation is proposed.	SDPWO Act Planning Act	Not yet started (scheduled as determined through EID processes)

* For works that are compliant with the ADR, these will be managed as approval notifications only.

5.1 Operational works (clearing vegetation)

Operational works for clearing vegetation outside from the List of exempt clearing work (resources.qld.gov.au)(ref link below) may be required for off-easement locations where this has been either:

- Not been included in the MID applications (noting specific application under the Approvals and Compliance Matrix) or
- Works do not meet exempt clearing works as per Schedule 21 of the *Planning Regulation 2017*.

For required operational works, the JV will then need to demonstrate clearing is Necessary environmental clearing under the Vegetation Management Act 1999. guideline for development applications (resources.qld.gov.au) provides a range of options to clear native vegetation necessary for environmental clearing.

UGLCPB JV will use this as one of the guiding tools, after which the JV will determine whether the project clearing meets 'accepted development vegetation clearing codes'. If so, works will proceed in accordance with the Code requirements. Where this is not the case, a development approval via SARA will be required.

The JV will utilise pre-clearance (field verified vegetation mapping) to determine applicable requirements.

5.2 Operational works (waterway barrier works)

Waterway Barrier Works (WWBW) is required for any crossing infrastructure within the bed and bank of mapped waterways a desktop assessment has been completed with reference to the State Development Assessment Provisions (SDAP) guideline for waterway barrier works.

The JV proposes the following process.

1. Identification of mapped waterways using QSpatial Queensland waterways for waterway barrier works spatial mapping data, assessing this information with available LIDAR (within the easement intersection and on access tracks from public roads to site as per GIS) to confirm presence/absence or misalignment of mapped waterways. Any waterways not present will be amended from scope subject to approval from DAF in regard to the applicable mapping.

2. Referring to the State Development Assessment Provisions (SDAP) guideline for waterway barrier works to determine if the proposed WWBW requires an assessable development approval or an accepted development notification.
3. Any waterways absent AND not as mapped but verified through desktop as present (using LIDAR) will be field assessed by suitable qualified personnel to determine if the landscape characteristics meet the definition of a waterway pursuant to the *Fisheries Act 1994*. For any mapped waterways not meeting the definition, discussion with DAF will be undertaken to determine next course of action.
4. Field verification for present mapped waterways will be undertaken progressively based on construction schedule and land access constraints. This will be undertaken by either specialist consultants or scouting party using checklists and field resources developed by a Suitably Qualified Person (SQP).
5. For all present mapped waterways, regardless of alignment issues, an assessment will be undertaken in accordance with the assessment framework under the State code 18- Construction or raising of waterway barrier works to determine where the crossing can be
    a. Accepted development as prescribed under *Fisheries (General) Regulation 2019* and /or
    b. Assessable development is required as prescribed under the *Planning Regulation 2017*, or
    c. A Development Approval is required.

Additionally, consideration of the requirements of the ADR will be undertaken based on layer colouring and the table below in Figure 6.

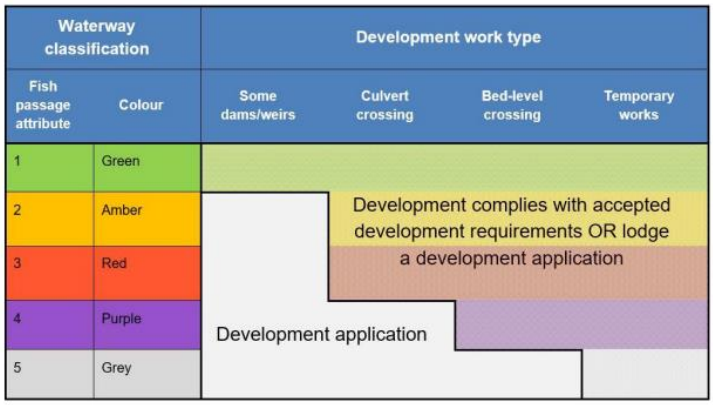

Figure 4 WWBW DA triggers

5.3 Water entitlement / operational works (interfering with water)

Pursuant to OSW/2020/5467 Exemption requirements for constructing authorities for the take of water without a water entitlement (Version 4.01 dated 05/02/2021), Powerlink is a “constructing authority” and is exempt from water entitlement licencing subject to compliance with conditions therein. Refer to Approvals SharePoint for saved copy.

The JV notes that Powerlink Queensland is also a “constructing authority” as defined under the *Acquisition of Land Act 1967*. If so, compliance with the requirements applies to taking of water. If not, *Water Act 2000* requirements apply. Specifically:

- A water licence is required for all taking of water (above and below ground).
- When a water licence is needed | Business Queensland (the holder would be the JV as a prescribed entity)
- All dam storages are to be constructed under operational works approvals
- All water bores are to be registered and constructed under operational works approvals
- Development assessment for water-related operational works | Business Queensland

- Operational works may be required for:
  - Water infrastructure at camp locations
  - Any take of water not authorised under the Powerlink water entitlements (exemptions under the *Water Act 2000*) that apply.

Note, water infrastructure on the transmission line associated with registered bore take, when comprising a turkey nest design or tank arrangement is interpreted to not trigger operational works.

An assessment will be undertaken during detailed design for any self-assessable or exempt development as construction water sources are confirmed.

Note, the project is not considered to result in 'interference of overland flow' through civil works.
Note it is proposed that all groundwater bores will be left *insitu* for a social legacy to benefit landholders/future users.

5.4 Riverine protection permit

Pursuant to WSS/2013/726 Riverine Protection Permit exemption guidelines (Version 2.03 dated 02/06/2023) (RPP guideline), Powerlink is a "approved entity" and if conditions can be complied with for crossing mapped watercourses (excludes drainage features). Refer to Approvals SharePoint for saved copy.

The JV notes that at the time updating this plan, Powerlink is currently seeking a Transmission Authority under the Electricity Act for the CopperString 2032 Project. If conditions cannot be complied with under the RPP guideline, then a RPP is required under the Water Act 2000.

The JV proposes the following to determine requirements.

- Identify watercourses which intersect the transmission easement construction access track and proposed access tracks off easement to access the transmission easement using the QSpatial watercourse layer. At intersects identify:
  - Whether mapped watercourses meet the definition of a watercourse under the Water Act 2000. This will involve field assessment during scouting / early works using a field checklist developed by an SQP.
  - If field verified as watercourses, confirm:
    - clearing requirements based on field verified vegetation using pre-clearance survey reports
    - construction requirements to create a safe access to construct the track (in terms of excavation and fill quantities).

Note, where watercourses are mapped dually with waterways that are field verified it will be assumed the waterways are classified as watercourses also and the RPP guideline applies unless clearing/earthworks triggers apply.

- For identified watercourse access track crossings compliant with the RPP, manage through construction compliance
- For watercourses not verified as watercourses, consult with DNR on excising from overlay and remove this constraint where required and approved by DNR.

For emergency works/disasters, this RPP guideline is not applicable.

5.5 Road corridor permits

5.5.1 State controlled roads

A Road Corridor Permit (RCP) is required for works in a State controlled road, if not conditioned by the MID. The RCP application process will be followed.

It is the responsibility (delegated by the Environment Manager) of the Senior Project Engineers to apply for RCPs.

In order to apply for an RCP, the requirements involve:

- Works description (preferably construction drawings that incorporates TMR review comments)
- Evidence of public liability insurance policy
- Deed of Indemnity to indemnify TMR from all legal claims arising from works in a State controlled road.

5.5.2 Local controlled roads

An RCP is required to work in a Local Government road reserve. Each LGA has a different RCP process, some formal and some informal. Contacts for each LGA have been identified by Powerlink Queensland.

- Charters Towers Regional Council: Roads – Charters Towers Regional Council
- Flinders Shire Council: Roads – Flinders Shire Council
- Richmond Shire Council: Approval for works on public areas and roads - Richmond Shire Council - QLD - Australian Business Licence and Information Service
- McKinlay Shire Council: Approval for works on public areas and roads - McKinlay Shire Council - QLD - Australian Business Licence and Information Service
- Cloncurry Shire Council: TBC
- Mount Isa Council: Roads, Signs and Footpaths – Mount Isa City Council
- Burdekin Shire Council: Local Law 1 – Road Reserve Works Permit – Burdekin Shire Council
- Applications nominally require 10 business days and evidence of a current public liability insurance policy.

5.6 Operational works (state controlled road)

Operational works in a State Controlled road reserve for purposes of upgrades may be required unless covered by the MID meeting the minimum requirements of the *Traffic Infrastructure Act 1995* including:

- Traffic impact assessment
- Road user management plan, as conditioned in the CoG Report.

If required, this constitutes assessable development and application will be made for a Development Approval via the project's SARA account.

5.7 Sales Permit / Assessable Development

The Forestry Act prescribes the use of quarry material by the leaseholder of a Land Act lease or landholder must meet the below requirements, otherwise sing sate-owned quarry material must be authorised under the Forestry Act.

- Do not remove it from the land parcel
- Only use it for a purpose consistent with the lease or with rights as a landowner (for clarity used for "the construction, maintenance or repair of essential land management infrastructure, consistent with the purpose or intent of the granted lease/tenure under the *Land Act 1994*).

Therefore the use of quarry material insitu for access track construction is not authorised without a Sales Permit. Note, quarry material includes stone, gravel, sand, rock, clay, soil and earth. Balanced earthworks to create a construction access track is not considered 'use'. However where additional material is won to surface the track or improve the track from another location than the footprint of the track, then this does not meet the definition of balanced earthworks and would trigger this requirement (i.e. constitutes a commercial gain).

Note, state owned land (quarry material) includes leasehold land and private land where the State has reserved the ownership of this material through a deed of grant.

In order to determine if a Sales Permit is required the JV will:

- Design the construction access track in accordance with relevant technical specifications

- Where additional spoil is required, identify whether the quarry material is State owned. Nominally on private land this means when the land was changed to freehold tenure. If before 31 December 1991, the landholder owns the resource, and it becomes a direct commercial matter between the JV and the landholder. If this changed after 31 December 1991, then the State owns it.

Dually the source of the quarry material would be subject to planning laws relevant to extractive industries. This may trigger:

- Assessable development under the planning scheme (not easement related) dependent on tenure
- Environmentally relevant activity (ERA) 16(2) for extractive activities where the amount exceeds 5000t per annum (note model operating conditions available).

5.8 Species management program

The project, based on the EIS, is located within an area with threatened species (pursuant to the NC Act) habitat (foraging and breeding) places present. To impact threatened species/tamper with a protected animal breeding place, a Species Management Program (SMP) (high risk) is required.

A SMP (high risk) will be applied for by the JV. Specialist ecological advice will be provided to develop a Species Management Impact Plan to support the application as per Section 5.1.2 application requirements of the above referenced guideline. This will be prepared on the basis of the animal breeding place survey and report completed by the Client by an SQP.

5.9 Protected plants clearing permit

There are 2 locations (refer to figure extract below) within a buffer of mapped (high risk area) protected plants. A flora survey will be required in accordance with the protected plants clearing guidelines to identify if a permit is required. This needs to be confirmed based on final alignment and easement width.

Depending on the outcomes of the flora survey:

- If no threatened or near threatened plants are in the clearing impact area, no permit is required, and the flora survey and an exemption clearing notification must be submitted at least one week prior to the start of clearing (and no more than 12 months from the date of the survey)
- If the survey shows at least 1 critically endangered/endangered/vulnerable or near threatened plant in the clearing impact area, then a protected plant clearing permit must be obtained.

5.10 Rehabilitation permit (spotter catcher activities)

A Rehabilitation Permit for fauna spotter catcher activities is required for all clearing works (for handling and rescuing fauna protected under the NC Act). This will be a requirement of the preferred Fauna Spotter Catcher specialist consultant. A record will be held by the JV.

5.11 Environmentally relevant activities

Prescribed ERAs have been identified as part of the accommodation hubs design and may include:

- Water treatment - ERA 64 If involving >0.5ML/d release of waste to waters or treating >10ML/d
- Wastewater (sewage) treatment – ERA 63(1)(b) based on >100 EP
- Fuel storage – ERA 8(1) if storing >50,000L of Class 1 dangerous goods (i.e. diesel)
- Extractive activities (crushing and screening) - ERA 16(3) or ERA 33 (if borrowing material, refer to Section 4.7)
- Regulated waste transport – ERA 57.

For all new ERA applications a Registration Certificate will be required. Some ERAs will be devolved to the subcontractor operating the camp facilities, or the waste service provider.

The operation of a motor vehicle workshop is a devolved activity administered under local planning schemes. Concrete batching will be deemed subject to the “code of practice” to meet the general environmental duty and does not trigger a need for a separate approval outside of those required by the planning scheme.

Prescribed ERAs will require an environmental licence before the activity can be constructed and operated. As part of camp design and procurement with the preferred subcontractor, relevant ERAs will be identified, and licences obtained as per the approvals matrix and in accordance with the planning approval applicable for the location.

5.12 Notifiable activities

Pursuant to the EP Act, if notifiable activities are being undertaken, notification is required. Notifiable activities are activities that have the potential to cause land contamination. The following notifiable activities may be triggered at the accommodation hubs. The JV will liase with PQ on the need or otherwise for these facilities.

- (potentially) 7- Chemical Storage, subject to whether more than 10t of chemicals that are dangerous goods under the Dangerous Goods Code is being stored
- (potentially) 15 – Explosives production or storage, subject to whether explosives are stored for purpose of blasting between Cloncurry and Mount Isa.
- 29 - Petroleum product or oil storage.

Application form available online. Landowners consent will be required (standard template available).

5.13 Contaminated spoil disposal

A contaminated soil disposal permit will be required in the following instance.

- When excess spoil is generated from a lot listed on the EMR
- Contamination testing of the excess spoil identifies contamination sufficient to warrant a permit as per advice by the Project’s Suitably Qualified Person (SQP).

The application of the disposal permit will be undertaken as per regulatory requirements identified using the link below, having full regard to the DES guideline “Disposal permit to remove, treat and dispose of contaminated soil”.

The application form with supporting information will be completed by an Environmental representative, reviewed by the SQP and then submitted by the Environment Manager to palm@des.qld.gov.au.

5.14 UXO assessment notice

Developing land affected by an UXO, if determined as present through field surveys requires a permit. The MID application is intended to manage this aspect however if not included for the transmission easements a development permit is required when a Material Change of Use application is triggered for which an area management advice has been given for an UXO. No MCU application is proposed. The required approvals outside a MID process are to be determined if required.

5.15 Water service provider

To treat and supply drinking water for camp operations the operator of the water treatment plant may be required to be registered. Where possible, drinking water for camp operations will be approved and sourced from the local town water supply main.

It is currently interpreted that the JV will not meet the definition of a ‘service provider’ as no charge for the service of water treatment is proposed.

This requires clarification with the administering authority of the WSSR Act, i.e. DRDMW.

Drinking water standards will be met through procurement of the correct equipment and operation and maintenance servicing. Where required to be distributed via tanker if treatment plants are not constructed at every facility (i.e. trucking between sites to minimise the number of plants), the Queensland Health requirements for water carriers will be met through provision of a subcontractor with a food licence under the *Food Act 2006*.

5.16 Building works

Building works is required for buildings classified under the Building Act. The JV proposes to engage a third party certifier for the building works when it is considered as an assessable development and in occasions does not comply with the relevant provisions under the accepted development of the Building Act. The certifier will identify:

- Building classes applicable based on concept design
- Any requirements to be met in detailed design
- Building inspections during construction and final stage.

This requirement may be devolved to the preferred camp subcontractor. The building certification process generally involves independently checking and approving building work to ensure it complies with the safety, health, amenity and sustainability standards specified in legislation and building codes.

The building certifier will lodge the development application with the relevant Council authority.
A third party certification process meets the requirements of a referral agency carrying out building assessment work and giving of a compliance certificate that will be assessed by a referral agency, to issue a building development approval/building permit where these are required.

5.17 Plumbing and drainage

Plumbing and drainage works at the accommodation hubs are subject to Council plumbing and drawing administered laws.

During construction Council representatives will be engaged to review and approve the relevant infrastructure internal and external to the camp sites.

Refer to Table4 for Council planning scheme links that include drainage requirements.
Plumbing and drainage will include:

- Pumps and pipes for distribution of water and wastewater across the site
- Stormwater controls
- Mains (water and sewerage) infrastructure connections.

Table 4 Council planning scheme links

Role	Plan	Plan Mapping
Charters Towers Regional Council	https://www.charterstowers.qld.gov.au/downloads/file/840/charters-towers-regional-town-plan-version-2	Regional Town Plan Maps – Charters Towers Regional Council
Flinders Shire Council	https://www.flinders.qld.gov.au/downloads/file/257/shire-of-flinders-planning-scheme---v11---28-february-2018pdf	
Mount Isa City Council	Planning Scheme 2020 – Mount Isa City Council	Infrastructure Services – Mount Isa City Council
Richmond Shire Council	Richmond_Shire_Planning_Scheme_2020.pdf (impartmedia.com)	
McKinlay Shire Council	https://www.mckinlay.qld.gov.au/downloads/file/533/mckinlay-shire-planning-scheme-2019	McKinlay Shire Planning Scheme (arcgis.com)
Cloncurry Shire Council	https://www.cloncurry.qld.gov.au/downloads/file/4/cloncurry-shire-planning-scheme-current	

Role	Plan	Plan Mapping
Townsville City Council	ePlanning - Townsville City Council	TownsvilleMAPS Mapping Service - Townsville City Council
Burdekin Shire Council	Planning Act Scheme – Burdekin Shire Council	Planning Act Scheme – Burdekin Shire Council

5.18 Trade waste

Where the project camp locations propose to discharge (non-sewerage) effluent to sewer, as opposed to a licensed onsite sewage treatment plant, a trade waste permit will be required.

Local Government requirements for trade waste depend on:

- Nature of the discharge (characteristics), for example commercial kitchen grease trap waste or oily water separated water from the motor vehicle workshop
- Volume of the discharge
- Period of the discharge.

The process will require application submission, fees and review of conditions of consent in order to finalise design and operate within limits.

No trade waste discharges are proposed at this stage.

5.19 Stock route impacts

Impacts on stock routes (use by temporary closure) are regulated and require permits from Local Government.

This is to be managed by Powerlink Queensland.

5.20 Biosecurity instrument permit

A Biosecurity Instrument Permit (BIP) is required for soil movement originating from electric/fire ant biosecurity zones to outside of the electric/fire ant biosecurity zones.

5.21 Condition amendments

Pursuant to the Acts in which the CoG Report, MID approvals and EPBC decision have been granted, amendments may be required based on Environment in Design (EID) processes (nominally at 40% design status). Of note there are administrative changes currently being pursued by Powerlink Queensland to address the scope of works for the project.

6. Approval Strategy

The regulatory approval management strategy for this RegAP is detailed below.

6.1 Engagement of specialists

The JV will appoint Specialist Consultants with expertise in:

- Waterway barrier works
- Species management (flora and fauna)
- Building works approvals
- Contaminated land.
- Shotfirer and explosive authority holder
- UXO

6.2 Design review

The JV will review available design with Specialist Consultants. This in an ongoing process and involves:

- Coordination of inputs from design and construction team
- Meetings with key internal Stakeholders and PQ
- Preparing ECAs that identify any package specific secondary approvals not yet obtained by the project.

6.3 Third party consultation

This step involves consultation with the third parties in relation to design of works within third party easements. Third party consultation will include:

- Council (with respect to local roads and accommodation hubs)
- Department of Transport and Main Roads (with respect to State roads)
- Queensland Rail (QR) (with respect to rail corridors)
- Mining entities (with respect to mining tenements)
- Electrical entities (with respect to electrical infrastructure)
- Gas entities (with respect to gas infrastructure)
- The landowner and other interests as identified by the Client or the Stakeholder engagement team.

6.4 Management of change

Iteratively, as part of design review and third-party consultation, the JV will ensure the final approval strategy is current and accurate having consideration of:

- Project changes/scope variations within the Contract
- Program changes
- Changes to the construction strategy based on design, procurement and resourcing.

6.5 Approval matrix

Following the above, the JV will prepare an approvals matrix that identifies the:

- Approval and applicable legislation (refer to Appendix C and D of the JV CEMP as reference)
- Responsible person (within the JV)
- Supporting documentation requirements (to ensure work scopes streamline the assessment)
- Schedule (for the drafting, submission and external assessment).

Refer to **Appendix B for current version**.

6.6 Pre-lodgement meetings

The JV at this stage will request pre-lodgements with Regulatory Authorities (State and Local) to review approval strategies and application requirements as required to streamline applications and achieve timely decisions. This involves preparation of information from a multi-disciplinary team across design and construction coordinated by the Environment Manager.

6.7 Preparation of application documentation

The JV, in accordance with pre-lodgement advice, will prepare application documentation in accordance with the responsibilities of this RegAP. Where possible applications will be combined based on scope and location whilst maintaining construction timeline flexibility. This will be achieved by:

- Coordination of the design manager and construction manager inputs into application documentation
- Mapping detailed design/construction requirements in relation to relevant environmental overlays
- Programming approval timeframes (preparation, review, decision periods and construction start dates) based on related design packages
- Integration of environment in design processes
- Maintaining an Approvals Register to track design, construction and specialist inputs
- Weekly regulatory approvals meeting.

Refer to **Appendix C for the draft version of the Approvals (Compliance) Register**.

A live SharePoint folder will be maintained to include at minimum:

- Regulatory Authority correspondences
- Application inputs and application documentation in draft
- Review comments (internal and external)
- Approved documents/submissions
- Approval copies.

6.8 Peer review processes pre submission

Upon drafting of the application documentation, the following peer review processes will occur:

- Environment Manager for completeness
- Construction team for feasibility of compliance.

At this stage the application documents, subject to any changes, will be released to Powerlink Queensland for peer review allowing up to 10 business days for this process (where required).
Changes requested by Powerlink Queensland are to be actioned by the author of the relevant application documentation and assembled by the Environmental Coordinator for formal submission.

6.9 Submission / lodgement of application

This stage involves submission of final applications peer reviewed. Submissions of approvals will be undertaken as follows.

- By the JV (Principal Contractor) OR
- By the JV Sub Contractors for delegated approvals related to self-performing works.

All submissions will be via the JV's SARA account.
All payment of application fees will be by the JV.

6.10 Post regulatory decision

Following decision of the application (or if the opportunity arises pre decision), all key Stakeholders are to undertake a review of approval conditions (including negotiation with administering authorities) to ensure a practical approach and compliance planning.

Update of the Approvals Register will occur that tracks:

- Applications planned (as per approvals matrix), under preparation and submitted for statutory decision
- Pre-lodgement records
- Issued approvals including:
  - Effective date
  - Expiry date (if applicable)
  - Links to copies of/conditions of approval.

Compliance verification with conditions of approvals will be undertaken in accordance with the environmental compliance approach in the JV CEMP which includes at minimum:

- Environmental inspections and audits, monitoring and reviews to gather evidence of compliance
- Creating a compliance tracking spreadsheet of approval conditions with the status of compliance in accordance with the Project's EMF, using the Approvals (Compliance) Register template/or like.

7. Roles and Responsibilities

To execute requirements of this RegAP, the following roles and responsibilities have been identified. Of note PQ have advised that the Approvals and compliance Matrix is currently under review and approvals and compliance clarity will be provided to address the roles and responsibilities

Table 5 RegAP roles and responsibilities

Role	Responsibility
TBA	Responsibilities and roles to be provided in the approvals clarity response from PQ.

Appendix A Approvals Matrix

PQ have advised that approvals clarity will be provided for the project (this appendix is not included).

Appendix B Approvals Register Template

PQ have advised that approvals clarity will be provided for the project (this appendix is not included).

COPPERSTRING 2032

COPPERSTRING 2032 JV

FLORA AND FAUNA MANAGEMENT PLAN

COPPERSTRING 2032

EDMS No : CSPW-EVN-PLN-900-000015
Revision : A02
Date : 06/06/2024

IFR

Approvals and Reviews

Flora and Fauna Management Plan	
Project	CopperString 2032
Client	Powerlink Queensland Pty Ltd
Document Number	CSPW-EVN-PLN-900-000015

Revision History					
Rev No.	Description of Revision	By	Checked	Approved	Date
A01	Initial draft for PQ review	Jacinta Fuller	David McLean	Matt Lennon	03/05/2024
A02	Updated in response to comments	Jacinta Fuller	David McLean	Matt Lennon	06/06/2024

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1. Introduction

The purpose of the CopperString 2032 project is to connect the North West Minerals Province (NWMP) of Queensland to the National Electricity Grid. This will not only allow existing loads in the Mt Isa and Cloncurry areas to be fed from the National Electricity Market (NEM), but also provide access to new mining loads and opportunity for connection of renewable generation.

1.1 Project scope

The CopperString 2032 Project is an extra high voltage transmission system intended to connect the North West Power System (NWPS) near Cloncurry and Mount Isa to the Powerlink network and NEM at Mulgrave. Figure 1 provides an overview of the Project.



Figure 1 CopperString 2032 proposed transmission lines and substations

The CopperString 2032 Project will connect the NWMP to the NEM to reduce the cost of power supply and facilitate the large-scale development of the Hughenden wind resource and solar resources within the North Queensland Clean Energy Hub (NQCEH).

The scope of work, traversing east to west, consists of the following sections:

- Mulgrave 500/275kV Substation as the CopperString 500kV connection point to the Queensland SuperGrid and 275kV line augmentation as the CopperString 275kV connection point to the NEM
- Pentland 500kV Substation to support the North Queensland Clean Energy Hub (NQCEH) expansion and as the core for future load connections in the area
- Flinders 500/300kV Substation (Hughenden) as the core for the NQCEH
- Dajarra Road 330/220kV Substation (Cloncurry) as the core for distributions to larger load centres
- The primary CopperString transmission backbone
- Termination via the Mount Isa augmentation 220/132kV.

The scope consists of a transmission line between the above locations carrying extra high voltage power transmission at 500kV, 330kV and 220kV respectively. Substations at the abovementioned interconnecting junctions will distribute power to the NWMP and NQCEH.

1.2 Abbreviations, acronyms and definitions

Table 1 contains a list of definitions/glossary of terms which are used in this document and are part of it.

Table 1 Abbreviations, Acronyms & Definitions

Term	Definition
Compliance audit	Verification of how implementation is proceeding with respect to a CEMP (which incorporates the relevant Approval conditions)
CMS	CPB Management System/ UGL Management system as referenced
CPB	CPB Contractors Pty Ltd
EMP	Environmental Management Plan
EMS	Environmental Management System
Environmental aspect or hazard	Defined by AS/NZS ISO 14001 as an element of an organisation's activities, products or services that can interact with the environment. The term 'hazard' is used throughout this CEMP and has the same meaning as 'aspect' for the purposes of compliance with ISO14001 requirements.
Environmental impact	Defined by AS/NZS ISO 14001 as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects.
Environmental incident	An unexpected event that has, or has the potential to, cause harm to the environment and requires some action to minimise the impact or restore the environment.
Environmental objective	Defined by AS/NZS ISO 14001 as an overall environmental goal, consistent with the environmental policy, that an organisation sets itself to achieve.
Environmental policy	Statement by an organisation of its intention and principles for environmental performance.
Environmental target	Defined by AS/NZS ISO 14001 as a detailed performance requirement, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.
EWMS	Environmental Work Method Statement
Hold point	A verification point that prevents work from commencing prior to approval from the appointed authority.
Lopped	Cut off (a branch, limb, or twig) from the main body of a tree.
Non-compliance	Failure to comply with the requirements of the Project approval or any applicable licence, permit or legal requirements
Non-conformance	Failure to conform to the requirements of Project system documentation including this CEMP or supporting documentation
SEP	Site Environmental Plan(s)

2. Project Environmental Management Obligations

2.1 Project environmental management obligations

The Project involves construction and operation of approximately 1,000km of extra high voltage overhead electricity transmission line that will connect the Northwest power system to the state electricity grid. The project includes six (6) new substations, electricity transmission line and transmission towers every 500-600 meters (m). To support construction of the project six construction camps, site offices, laydown/delivery areas, concrete batching plants, and access tracks to the corridor and along its alignment will be provided. The project also provides for improved communications, with the installation of fibre optic cables.

The Coordinator General (CoG) for the Department of State Development, Infrastructure, Local Government and Planning declared the project to be a 'coordinated project' under *the State Development and Public Works Organisation Act 1971* (SDPWO) requiring an Environmental Impact Statement (EIS) for the Project. In September 2022, the Coordinator General provided an evaluation report (CoG Report) on the submitted EIS for the project. This report includes an evaluation of Matters of National Significant (MNES) with recommended conditions for an approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth). In November 2022, a notification of approval was granted from the Department of Climate Change, Energy, the Environment and Water (DCCEEW) (Commonwealth) under the EPBC Act with conditions specific to the Project.

The CoG report also includes recommended conditions for proposed subsequent Ministerial Infrastructure Designations for consideration under the *Planning Act 2016* (Qld) by the Queensland Planning Minister.

The CoG evaluation was based on the draft and revised EISs, submissions made, public consultation on the draft EIS and advice from relevant Australian, State and Local government agencies.

To address and comply its legislative obligations, the UGLCPB JV has prepared a Regulatory Approvals Plan (refer Fig 2) which identifies the environmental approvals applicable to the Project.

The project scope includes (but not limited to):

- Clearing vegetation and earthworks for a transmission line and ancillary infrastructure (e.g. off-easement access tracks and water sources) involving:
  - Disturbance to Matters of National Environmental Significance
  - Disturbance to Matters of State Environmental Significance
  - Interfering with protected species (flora and fauna)
  - Works within Native Title claimed areas
  - Land affected by Unexploded Ordnance (UXO)
- Constructing and operating accommodation hubs with facilities including:
  - Clearing regulated vegetation
  - Accommodation units and offices, and carparking (involving building and plumbing and drainage works)
  - Mains connection (power, water and sewerage)
  - Mobile and temporary concrete batching plants
  - Motor vehicle workshop
  - Fuel (chemical) storage
  - Water treatment, for provision of drinking water
  - Wastewater (sewage) treatment
  - Biosecurity washdown bays
- Taking water (surface and groundwater)
- Use of quarry material from commercial sources, although project specific borrow pits may be identified as an opportunity
- Crossing mapped waterways and water courses for access
- Upgrading public roads
- Working within and adjacent to rail corridors
- Disposing of contaminated soil (if found within properties listed on the Environmental Management Register (EMR).

2.2 Relevant legislation and guidelines

Construction of the project must comply with environmental legislation and guidelines, and any additional requirements specified in approval conditions.

Specific legislative and other requirements relevant to this plan are detailed below.

2.2.1.1 Commonwealth Legislation

Commonwealth legislation that is relevant to the project and this plan includes:

- *Environment Protection and Biodiversity Conservation Act 1999.*

2.2.1.2 State Legislation

State legislation that is relevant to the project and this plan includes:

- *Environment Protection Act 1994*
- *Nature Conservation Act 1992*
- *Vegetation Management Act 1999*
- *Fisheries Act 1994*
- *Biosecurity Act 2014*
- *Planning Act 2016*
- *Water Act 2000*
- *State Development and Public Works Organisation Act 1971.*

2.2.1.3 Standards and Guidelines

Standards and guidelines that are relevant to the project and this plan include:

- *Guidelines for biological survey and mapped data* (Department of the Environment and Energy, 2018)
- *Guide to providing maps and boundary data for EPBC Act projects* (Department of Agriculture, Water, and the Environment, 2021)
- *Accepted development requirements for operational work that is constructing or raising waterway barrier works* (Department of Agriculture and Fisheries, 2018)
- *Riverine Protection Permit Exemption Requirements WSS/2013/726 Version 2.01* (former Department of Natural Resources, Mines and Energy, 2019).

3. Management Plan Interface

This Flora and Fauna Management Plan (FFMP) is an overarching sub-plan, informing the Construction Environmental Management Plan (CEMP) as identified below in the Environmental Management Framework (EMF).

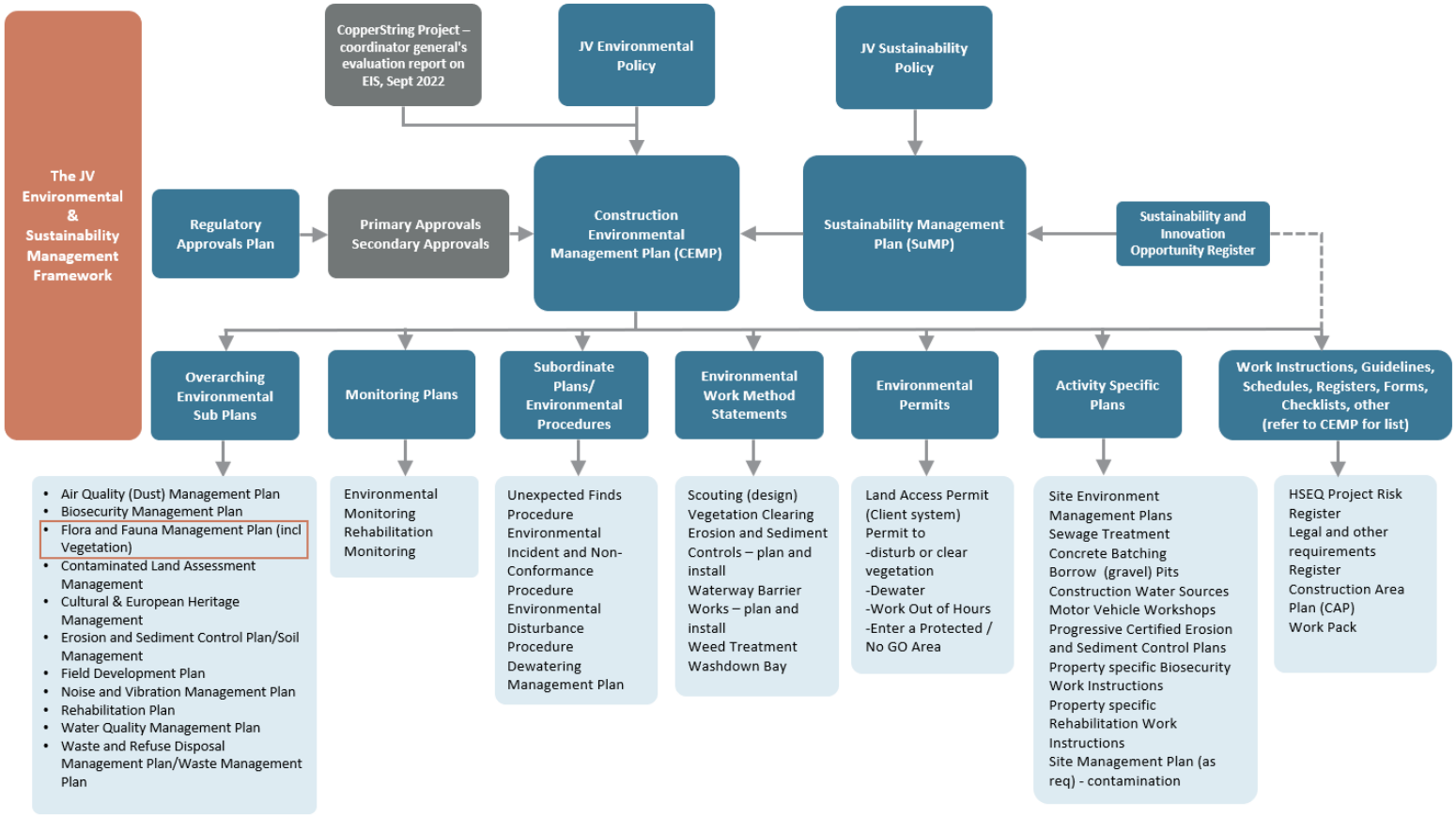


Figure 2 Environmental Management Framework – FFMP interface

3.1 Conditions of approval – requirements and commitments schedule

Table 2 summarises the flora and fauna requirements and commitments that are relevant to the project and notes where they have been addressed in this plan

Table 2 Environmental requirements and obligations relevant to this plan

Ref	Requirement	Where addressed
Environment Protection and Biodiversity Conservation approval (EPBC 2019/8416)		
1	To minimise impacts on protected matters, the approval holder must not clear outside of the study area.	Refer to Sections 7.1, 7.3 and 7.7
2	To minimise impacts on protected matters, the approval holder must not clear more than: a. 663.87 hectares (ha) of Southern Black-throated Finch breeding habitat; b. 42.03 ha of Southern Black-throated Finch foraging habitat; c. 42.05 ha of Squatter Pigeon (southern) breeding habitat; d. 8.77 ha of Squatter Pigeon (southern) foraging habitat; e. 393.21 ha of Koala habitat; f. 112.57 ha of Night Parrot breeding habitat; g. 195.73 ha of Night Parrot foraging habitat; h. 219.14 ha of Australian Painted Snipe habitat; i. 945.57 ha of Painted Honeyeater habitat; j. 243.28 ha of Julia Creek Dunnart habitat; k. 69.82 ha of Ornamental Snake habitat; or l. 121.78 ha of Plains Death Adder habitat.	Refer to Sections 6 and 7.7
3	To avoid impacts on Red Goshawk, the approval holder must not clear or impact Red Goshawk nests	Refer to Section 7.3 and 7.7
4	If, during pre-clearance surveys, construction or operation of each stage as identified in the Offsets Management Strategy, the approval holder becomes aware that; a. any protected matters that were not described in the EIS as likely to occur in the study area, are present in the study area; or b. any protected matters that were not described in the EIS as likely to be significantly impacted by the action, could be significantly impacted by the action then the approval holder must: c. cease any work associated with the action, excluding surveys, that may impact the protected matter(s) until the Minister has confirmed in writing what components of the action may commence and when; d. notify the department in writing, within two business days of becoming aware of any of the above circumstance for protected matters, of the information of which it has become aware; and e. submit to the department, within 15 business days of becoming aware of any of the above circumstance for protected matters, a detailed report of the presence and distribution of the protected matters, the potential impacts of the action on the protected matters, and proposed offsets where significant impacts are identified. The report must be written by a suitably qualified expert.	Refer to Section 9 and Appendix B

Ref	Requirement	Where addressed
8	For each project stage. the approval holder must undertake pre-clearance surveys for the presence of the protected matters and their habitat identified in Attachment A in all locations proposed to be disturbed by the Action in the stage. The pre-clearance surveys must be undertaken no more than 12 months prior to clearing occurring for the stage, and be undertaken by a suitably qualified expert.	Refer to Section 7.1
12	The PCSR required under condition 10 must inform the rehabilitation at the completion of the action. At completion of the action, the approval holder must ensure all rehabilitation areas are reinstated to the pre-disturbance vegetation community, using endemic native species appropriate to their position in the landscape and in accordance with the EIS and PCSR.	Refer to Rehabilitation Management Plan
15	For each project stage, the approval holder must implement the associated MNES Management Plan approved by the Minister in accordance with condition 13. The approved MNES Management Plan must be implemented from the commencement of clearing for the associated project stage and for the duration of clearing, construction, and operation for the associated project stage.	Refer to Section 7.7
16	By implementing the MNES Management Plan the approval holder must achieve the following environmental objectives: a. Except for the clearance impacts permitted under condition 2, avoid, mitigate and manage impacts to protected matters; and b. The requirements under condition 3.	These objectives will be supported through the implementation of this plan
32	Unless otherwise agreed to in writing by the Minister, the approval holder must publish each plan on the website within 15 business days of the date: a. the plan is approved by the Minister in writing, if the plan requires the approval of the Minister; or b. the plan is submitted to the department in accordance with a requirement of these conditions, if the plan does not require the approval of the Minister; or c. the plan is approved by a state/territory government official as required under a state/territory government condition which must be complied with in accordance with these EPBC Act conditions.	Refer to Section 7.7
40	The approval holder must ensure that any monitoring data (including sensitive ecological data), surveys, maps, and other spatial and metadata required under the conditions of this approval are prepared in accordance with the department's Guidelines for biological survey and mapped data (2018), or any subsequent official version or as otherwise specified by the Minister in writing.	Refer to Section 7.1
41	The approval holder must ensure that any monitoring data (including sensitive ecological data), surveys, maps, and other spatial and metadata required under the conditions of this approval are prepared in accordance with the department's Guide to providing maps and boundary data for EPBC Act projects (2021), or any subsequent official version or as otherwise specified by the Minister in writing.	Refer to Section 7.1
Coordinator General's Report, Appendix 2 Part A		
A8	Any MID request(s) must report outcomes of consultation with relevant local government councils, DAF and other relevant government agencies regarding waterway crossings for project access tracks. This should include any requirements for waterway barrier works approvals associated with access tracks for the project identified through this consultation.	Refer to Section 7.7

Ref	Requirement	Where addressed
Coordinator General's Report, Appendix 2 Part B		
B16(a)	Retain existing mature vegetation unless required to be removed to facilitate the proposed development or respond to an unacceptable safety risk which is to be confirmed by a suitably qualified person.	Refer to Section 7.7
B16(b)	Prior to the commencement of works, undertake the necessary actions to protect vegetation that is not required to be cleared from construction impacts.	Refer to Sections 7.3 and 7.7
B16(c)	Relocate any removed habitat features and resources (e.g. large woody debris, tree hollows, logs, rocks) required to be removed to facilitate the proposed development to adjacent areas.	Refer to Sections 7.3 and 7.7
B16(d)	Cleared vegetation must: i. not be stacked or pushed against mature trees, habitat trees or tall immature trees that is not required to be cleared from construction impacts ii. not obstruct the flow of drains or watercourse iii. allow safe passage for stock and vehicles.	Refer to Section 7.7
B17(a)	Any impacts of the action on matters of state environmental significance (MSES) including threatened species habitat and the Ballara Nature Refuge is to be generally in accordance with the project corridor as assessed in the project EIS and evaluated in the Coordinator-General's evaluation report for the project.	Not applicable to this scope of works
B17(c)	The action as assessed in the EIS and evaluated in the Coordinator General's evaluation report for the project must not impact on more than the maximum disturbance limit for each MSES identified below: i. Purple-necked rock wallaby habitat: maximum disturbance limit 90.77ha ii. Ballara Nature Refuge: maximum disturbance limit 191.52 ha iii. Koala habitat*: maximum disturbance limit 393.21 ha iv. Squatter pigeon habitat *: maximum disturbance limit 50.82 ha v. Black-throated finch habitat *: maximum disturbance limit 705.90 ha vi. Night parrot habitat *: maximum disturbance limit 308.29 ha vii. Australian painted-snipe habitat *: maximum disturbance limit 219.14 ha viii. Painted honeyeater habitat *: maximum disturbance limit 945.57 ha ix. Julia Creek dunnart habitat *: maximum disturbance limit 243.28 ha x. Ornamental snake habitat *: maximum disturbance limit 69.82 ha xi. Plains death adder habitat *: maximum disturbance limit 121.78 ha. Notes: *this MSES is also listed as matters of national environmental significance (MNES) under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). This MSES, including biodiversity offset obligations for significant residual impacts, are to be addressed by a decision on the project under the EPBC Act. No significant residual impact has been identified in evaluation of the project EIS on MSES not listed in this condition. No significant residual impact is authorised for any MSES other than those listed in this condition.	Refer to Sections 6 and 7.7
B17(d)	Prior to commencement of the action, pre-clearance surveys are to be undertaken to confirm the extent of impact to the above matters as a result of project activities. Surveys by a suitably qualified wildlife officer or ecologist must including a pre-clearing inspection of trees, wet areas and	Refer to Sections 7.1 and 7.3

Ref	Requirement	Where addressed
	other suitable vegetation or habitat for listed threatened fauna, hollows, nests and other breeding places.	
B17(e)	The suitably qualified wildlife officer or ecologist must be present during clearing operations: i. to advise on the staging and sequencing of clearing ii. to ensure risk of injury to, or death of fauna is minimised.	Refer to Section 7.7
B17(i)	Final impacts on each MSES are to be confirmed in a post-construction audit, reported to the Department at the completion of construction of the/each action.	Refer to Section 9
B18	i. Prior to the commencement of construction, the proponent must determine all species breeding places requiring a species management program (SMP), including the purple necked rock wallaby. An SMP for each species is to consider results of targeted preclearance surveys of potential listed threatened species habitat within the project footprint. ii. Each SMP is to include: i. detail of targeted pre-clearance surveys of potential habitat undertaken within the clearing footprint and any other species-specific investigations ii. measures to limit construction activities to avoid breeding seasons of threatened species iii. where required, measures to relocate individuals identified during pre-clearance surveys by qualified and experienced fauna spotter-catchers, install fauna exclusion fencing and enforce speed limits onsite. iii. SMPs are to be lodged with DES for approval under the NC Act.	Refer to Section 7.2
B19	a. Prior to commencement of works, prepare a Rehabilitation Monitoring Plan (RMP) for the assessment and progressive rehabilitation of disturbed areas, prepared by a person suitably qualified in site rehabilitation. b. The RMP must include/address: i. all areas of temporary disturbance to be rehabilitated following construction ii. soil stabilisation, direct seeding, managing natural regeneration and weeds iii. re-use of hollow-bearing stags, woody debris, logs and rocks iv. measures to ensure the restoration and reconnection of habitats v. measures to ensure bank stability and water quality as a result of clearing within watercourse or drainage features vi. monitoring, auditing and reporting objectives undertaken annually for the first 5 years, to monitor native vegetation regeneration progress, presence of weeds or other disturbance d. Following completion of works, undertake the rehabilitation of the development generally in accordance with the rehabilitation plan.	Refer to Rehabilitation Management Plan
B20	a. Prior to commencement of works, prepare a biosecurity management plan (BMP). b. The BMP must be prepared by a person suitably qualified in biosecurity management and include/address i. alignment with key national, state and local biosecurity priorities ii. collaboration with landholders on any existing property specific integrated pest management or biosecurity management plans	Refer to Biosecurity Management Plan

Ref	Requirement	Where addressed
	iii. known weeds of national significance, restricted, invasive or regionally declared weeds identified in the project corridor iv. identification of the origin of high-risk construction materials, machinery and equipment v. clean down protocols and locations vi. management and treatment methods to control spread of weeds vii. promotion of awareness of weed management among project workers viii. routine weed monitoring during construction and operation to identify any new incidence of weeds considering weed flowering, setting seed and dispersal. d. Prior to the commencement of works at each location, implement the mitigation measures and recommendations of the BMP.	
B21	i. Prior to the commencement of works, undertake a site inspection to confirm the presence of any invasive, declared or pest species (flora or fauna). If found, manage these in accordance with the BMP. i. Following the first wet season after completion of works, undertake a site inspection to confirm the presence of any invasive, declared or pest species (flora or fauna). If found, remove these in accordance with legislative requirements.	Refer to Section 7.1 and Biosecurity Management Plan
B32	All external lighting is installed and maintained to accord with Australian standards and shielded to minimise light spill to the surrounding environment.	Refer to Section 7.7
B33(a)	Prior to the commencement of works, prepare and submit a Construction Environmental Management Plan (CEMP) to DSDILGP (infrastructuredesignation@dsdlgip.qld.gov.au). The CEMP must be consistent with management measures detailed in the project EIS and, and must include/address the following: iii. Flora and Vegetation and Fauna Management Plans	This plan
B33(a)	iv. a Rehabilitation Plan for temporary construction sites and cleared areas that includes: • rehabilitation measures for disturbed areas as soon as practicable to limit exposure to erosive processes • remediation measures for any areas of contaminated land commitments, mitigation, and management measures consistent with those identified in the project EIS.	Refer to Rehabilitation Management Plan
B33(a)	ix. a Biosecurity Management Plan	Refer to Biosecurity Management Plan
CopperString 2.0 Environmental Impact Statement Commitments		
C8	Suitable weed control measures will be implemented during construction and operation of the Project. The Project will consult with local government weed and pest management officers and landholders during the development of Biosecurity Plans for the Project.	Refer to Biosecurity Management Plan
C25	A Rehabilitation plan that outlines measures for rehabilitating temporary construction sites and associated infrastructure (including temporary construction camps or clearing around substations), following completion of the construction schedule will be developed.	Refer to Rehabilitation Management Plan
C26	A Rehabilitation plan outlining the requirements for the rehabilitation of land cleared within the corridor selection during construction will be provided prior to construction. Site and stage-specific rehabilitation sub-plans will also be developed, and include tower assembly areas, tower	Refer to Rehabilitation Management Plan

Ref	Requirement	Where addressed
	pads, brake and winch sites, CEV Huts and temporary access tracks not required during the operation and maintenance of the transmission infrastructure.	
C35	In circumstances when it is not possible to avoid, disturbances will be minimised, mitigated and remediated.	Refer to Section 7.7
C50	CuString will develop Road Use and Traffic Management Plans which will address wet weather aspects associated with the use of unsealed access tracks. Many soils in the study area are susceptible to varying types of erosion. To mitigate this impact, an erosion and sediment control plan will be developed prior to construction and implemented. These plans will include measures to avoid, manage or mitigate potential risk to soils, including specific reference to management/mitigation of risks associated with salinity, specifically providing evidence of no clearing in salinity expression areas. **This will be used in conjunction with a vegetation management plan and rehabilitation plan which will include actions suitable to manage or prevent cumulative impacts to the geology and soils.**	This plan (vegetation management plan) Refer to Rehabilitation Management Plan
C51	Direct impact to areas of high ecological value will be avoided or minimised through the process of corridor realignments or spanned across wherever possible using higher towers as appropriate to the ecological values and the terrain constraints. In areas of high ecological value this will enable vegetation below 20 m to be retained and mature trees over 20 m may be trimmed if necessary for safety and operational requirements.	Refer to Section 7.7 Refer to Field Development Plan
C52	Direct impact to watercourses by transmission towers will be avoided by implementing buffer distances and sighting towers so the alignment can completely span waterways. No towers will be located within a watercourse or its riparian zone.	Refer to Section 7.7 Refer to Field Development Plan
C53	Micro-siting of towers will occur to avoid key localised ecological resources such breeding, nesting or refuge sites for conservation significant species including but not limited to the black-throated finch (southern), squatter pigeon(southern), Julia Creek dunnart, ornamental snake, greater glider and koala.	Refer to Section 7.7 Refer to Field Development Plan
C54	In areas of importance for conservation significant species where high levels of fauna connectivity is unavoidably impacted, retention of remnant vegetation strips will be considered to maintain connectivity and reduce habitat fragmentation / isolation. This will be undertaken in areas where the vegetation strips will not impact the operational safety of the network infrastructure	Refer to Section 7.7 Refer to Field Development Plan
C55	Temporary and permanent structures and infrastructure will be located in areas of non-remnant or least concern vegetation to minimise clearing of high value vegetation (in particular of concern)	Refer to Section 7.7 Refer to Field Development Plan
C56	A Flora and Fauna Management Plan will be developed prior to construction commencing. The Flora and Fauna Management Plan will include details relevant to the general management of flora and fauna impacts as well as Species Management Plans for identified conservation significant species that will be impacted. Where necessary, the Flora and Fauna Management Plan will incorporate flora and fauna monitoring activities. Specifically, ongoing monitoring and survey requirements necessary to assess the persistence and health of conservation significant populations will be outlined (i.e. EVNT flora and fauna species impacted by the Project). For more information on the flora and fauna management plan, refer to Volume 3 Appendix O Environmental management plan.	This plan Refer to Sections 7.2 and 8

Ref	Requirement	Where addressed
C57	The Construction Environmental Management Plan will include rehabilitation measures for areas to be temporarily disturbed during construction will be developed prior to construction commencing with the overall aim of minimising the amount of land disturbed at any one time during the construction of the Project. As soon as practicable after cleared areas are no longer required (i.e. temporary construction camps, laydown areas, quarries, borrows, turning circles and access tracks), rehabilitation will commence. Temporary construction infrastructure will be decommissioned and removed from site. The sites will then be rehabilitated. Rehabilitation measures will include: • Removal of potentially hazardous stored substances • Remediation of any contaminated areas • Grading of disturbed surface to a state generally consistent with a natural topography (if required) and to ensure that permanent drainage lines are not compromised • Application of topsoil and revegetation with species adapted to the site. • Requirements and mechanisms for post-construction monitoring of rehabilitation success. • Certain vegetation cleared during construction may be chipped or mulched and used in the rehabilitation of erosion prone areas. Any temporary watercourse crossings will be rehabilitated to a similar profile to minimise flood erosion risks. The Construction Environmental Management Plan include procedures for revegetation species selection, ground preparation and sowing/planting.	Refer to Rehabilitation Management Plan
C58	The corridor selection will be located to avoid disturbances within sensitive areas mapped as wetlands and semi-evergreen vine thicket.	Refer to Section 7.7 Refer to Field Development Plan
C61	The extent of vegetation clearing (and no-go areas) will be clearly identified on construction plans and in the field using high visibility fencing or flagging in the vicinity of high conservation significant areas. Clearing extent will be communicated to construction supervisors.	Refer to Sections 7.3 and 7.7
C62	Where infrastructure must cross waterways, areas of existing disturbance (i.e. existing tracks or clearing) will be used. Where this is not practicable, the Project footprint will be minimised and the stumps of large habitat trees retained. Waterway crossings in known habitat for conservation significant flora and fauna species will aim to avoid occurrences of conservation significant flora species. Transmission lines will span across the riparian habitat corridors wherever possible.	Refer to Section 7.7
C63	A CEMP will be prepared and implemented for standards such as weed hygiene, erosion, fuels and hazardous substances, fire, etc. The CEMP will include protocols to limit injury and mortality to fauna including management of risks associated with open excavations, trenching, waterbodies and responses and reporting for roadkill and adverse incident protocols	Refer to Biosecurity Management Plan Refer to Section 7.7
C67	Management strategies with reference to biosecurity will be developed to reflect the level of risk proposed for Project activities and Project work fronts.	Refer to Biosecurity Management Plan
C68	All relevant personnel working in the field on the Project will receive an induction regarding biosecurity matters and management requirements relevant to their specific work activities and Project work front.	Refer to Biosecurity Management Plan

Ref	Requirement	Where addressed
C70	The Construction Contractor(s) will undertake a detailed assessment of biosecurity risks associated with specific work activities and construction methods	Refer to Biosecurity Management Plan
C71	Prior to leaving their point of origin for access to the Project site, all vehicles, plant, equipment and machinery shall be cleaned down and be accompanied by a current and certified Biosecurity Declaration Form from the entity responsible for the clean down.	Refer to Biosecurity Management Plan
C72	CuString will develop and implement a movement control plan and species specific biosecurity treatment procedures.	Refer to Biosecurity Management Plan
C73	Biosecurity will be managed in accordance with the Construction Environment Management Plan, Prior to leaving a Project work front, or moving between Project work fronts or biosecurity risk areas, all vehicles, plant, equipment and machinery shall undergo clean down at designated facilities and a new Biosecurity Declaration Form completed. Any specific landholder requirements will also be noted apart of the clean down requirements.	Refer to Biosecurity Management Plan
C74	Access tracks, stockpiles, and laydown/delivery areas will be located as far as practicable away from important wetlands, waterways and drainage lines.	Refer to Section 7.7
C75	Taller transmission line structures will be employed near waterways to ensure that spanning of riparian vegetation is achieved where practicable and disturbance is minimised.	Refer to Section 7.7
C76	Riparian vegetation will be retained where practicable to maintain waterway bank stability.	Refer to Section 7.7
C77	Ground disturbance will be minimised wherever practical by using existing cleared areas for construction laydown/delivery areas and material stockpiles.	Refer to Section 7.7
C78	All disturbed areas will be rehabilitated as soon as practicable in order to establish ground cover and limit the duration that disturbed ground surfaces are exposed to erosive processes.	Refer to Rehabilitation Management Plan
C98	Where necessary, restricted invasive plants material will be disposed in accordance with the biosecurity measures in the CEMP.	Refer to Biosecurity Management Plan
C149	The corridor selection will avoid environmentally sensitive areas when determining the corridor detailed design.	Refer to Section 7.7
C151	An adaptive management and monitoring protocol will be developed and included in the Flora and Fauna management plan to monitor the ongoing impacts during the life of the Project.	Refer to Section 8
C153(a)	As part of the Project various overarching management plans will be developed and implemented in relation to the broader environmental aspects for the project:	Refer below
C153(a)	• Biosecurity Management Plan	Refer to Biosecurity Management Plan
C153(a)	• Field development plan	Refer to Field Development Plan
C153(a)	• Rehabilitation plan	Refer to Rehabilitation Management Plan
C153(a)	• Species specific management plan	Refer to Section 7.2

Ref	Requirement	Where addressed
C153(b)	As part of the Construction Environmental Management Plan, various sub-plans will be developed and implemented in relation to the environmental aspects for the project:	Refer below
C153(b)	• Biosecurity Management	Refer to Biosecurity Management Plan
C153(b)	• Flora & Vegetation Management	This plan
C153(b)	• Fauna Management	This plan
C165	Where offsets are required under approval conditions an Offset Management Plan will be prepared in accordance with the Biodiversity Offsets Management Strategy prepared for the project.	Refer to Biodiversity Offsets Management Strategy
C166	Should apiarists consider placement of beehives inside the easement, advice on suitable techniques to shied beehives from electric field generated by the transmission line will be provided.	Refer to Section 7.7
Coordinator General's Change Report No. 1, Appendix 2 Part A		
A2	Prior to construction commencing, the proponent must submit a construction environmental management plan (CEMP) to the Coordinator-General, which must be consistent with management measures detailed in the change application for the Hughenden workers accommodation camp and must include the following: i. a Flora and Fauna Management Plan	This plan
A11(a)	Retain existing mature vegetation unless required to be removed to facilitate the proposed development or respond to an unacceptable safety risk.	Refer Section 7.7
A11(b)	Prior to the commencement of works, undertake the necessary actions to protect vegetation that is not required to be cleared from construction impacts.	Refer Sections 7.3 and 7.7
A11(c)	Relocate any removed habitat features and resources (e.g. large woody debris, tree hollows, logs, rocks) required to be removed to facilitate the proposed development to adjacent areas.	Refer Sections 7.3 and 7.7
A11(d)	Cleared vegetation must: i. not be stacked or pushed against mature trees, habitat trees or tall immature trees that is not required to be cleared from construction impacts ii. not obstruct the flow of drains or watercourses.	Refer Section 7.7
A11(e)	Prior to the commencement of construction, the proponent must determine all species breeding places requiring a species management program (SMP). An SMP for each species is to consider results of targeted pre-clearance surveys of potential listed threatened species habitat within the project footprint.	Refer to Section 7.2 and Appendix B
A11(f)	SMPs are to be lodged with the Department of Environment, Science and Innovation (DESI) for approval under the *Nature Conservation Act 1992*.	Refer to Section 7.2 and Appendix B
Coordinator General's Change Report No. 1, Appendix 2 Part C		
C2	Works must comply with the Department of Agriculture and Fisheries (DAF) Accepted development requirements for operational work that is constructing or raising waterway barrier works or the proponent is to liaise with DAF regarding any operational works permit(s) required for the construction or raising of waterway barrier works.	Refer Section 7.7
HSE Specification for Contractors and Suppliers (CSPW-HSW-SPE-M8-000001, revision B) (HSE Specification)		

Ref	Requirement	Where addressed
9.5 Native Fauna	The Contractor must ensure no unauthorised impacts to protected fauna. Minimise impacts on native fauna and breeding places from construction activities.	This Plan
9.5 Native Fauna a)	Prior to any disturbance activity, impacts to protected native fauna must be assessed under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC) and *Nature Conservation Act 1992* (NC Act). Any additional assessments required must be undertaken by a suitably qualified person and any subsequently identified required approvals and/or offsets must be obtained prior to the works commencing.	Refer to Sections 6 and 7.7
9.5 Native Fauna b)	Identify where water crossings may need to be constructed or upgraded and assess against the Accepted Development Requirements for Operational Work that is Constructing or Raising Waterway Barrier Works (ADR). Obtain any permits required for work that is not accepted development.	Refer to Section 7.7
9.5 Native Fauna c)	Impact to protected native fauna must be completed in accordance with any relevant Works Approvals.	Refer to Section 7.7
9.5 Native Fauna d)	Tampering with an animal breeding place may only be carried out in accordance with a Damage Mitigation Permit or an approved Species Management Program.	Refer to Sections 7.2 and 7.7
9.5 Native Fauna e)	Construct and/or upgrade water crossings in accordance with the ADR and/or permit conditions.	Refer to Section 7.7
9.5 Native Fauna f)	Suitably qualified fauna spotter catchers must be engaged to undertake pre-clearance habitat searches and be present during vegetation clearing activities to minimise harm to fauna.	Refer to Section 7.7
9.5 Native Fauna g)	A suitably qualified person (i.e. spotter catcher) must be present during any disturbance to habitat features (e.g. trees containing hollows, trees containing nests, hollow logs) and/or native fauna.	Refer to Section 7.7
9.5 Native Fauna h)	Habitat features such as felled trees and logs will be relocated where possible to adjacent areas.	Refer to Section 7.3
9.5 Native Fauna i)	An authorised carer (holding a valid Rehabilitation Permit) must be engaged to care for and rehabilitate injured or orphaned native animals.	Refer to Section 7.7
9.5 Native Fauna j)	Domestic pets and animals are prohibited on site during works.	Refer to Section 7.7
9.5 Native Fauna k)	Restrict vehicles to approved and mapped access tracks and only those vehicles required for the safe, efficient and essential construction activities will be allowed in the work area.	Refer to Section 7.7
9.5 Native Fauna l)	Excavations must be secured to prevent access from native fauna.	Refer to Section 7.7
9.5 Native Fauna m)	Diverters on spans will be installed where identified as required.	Refer to Section 7.7
9.5 Native Fauna n)	Fauna friendly anti-climbing barriers will be installed on towers where wildlife interactions have been identified or are likely.	Refer to Section 7.7
9.6 Protected Areas	No unauthorised disturbance within a Protected Area, World Heritage Area or State Forest. a. Activities in a Protected Area, World Heritage Area or State Forest must be authorised to be carried out by the relevant government agency.	Refer to Section 7.7

Ref	Requirement	Where addressed
9.7 Vegetation Management	Minimise disturbance of vegetation, consistent with safe and reliable operation of the assets.	Refer to Section 7.7
9.7 Vegetation Management a)	Proposed vegetation clearing activities must be assessed against all relevant federal, state and local government requirements. Any additional assessment must be undertaken by a suitably qualified person and any subsequently identified required approvals and/or offsets must be obtained prior to undertaking vegetation clearing activities.	Refer to Section 7
9.7 Vegetation Management b)	The extent of vegetation clearing areas will be nominated on plans and made available for the vegetation clearing activity.	Refer to Section 7.3
9.7 Vegetation Management c)	Vegetation clearing activities must be undertaken in accordance with: i. Any relevant permits and approvals; and ii. Approved Powerlink specifications.	Refer to Section 7
9.7 Vegetation Management d)	Any proposed vegetation clearing activities not in accordance with existing permits and approvals must be assessed against all relevant federal, state and local approvals. Assessments must be undertaken by a suitably qualified person. Any additional required permits or approvals must be obtained prior to undertaking vegetation clearing activities.	Refer to Section 7
9.7 Vegetation Management e)	Project spatial information will nominate any Project specific areas that have specific management requirements (e.g. no-go-zones, vegetation to be retained).	Refer to Section 7.7
9.7 Vegetation Management f)	Prior to commencing initial vegetation clearing, the extent of clearing (work area) shall be clearly marked on site using high visibility barriers or taping to ensure that clearing will not occur in areas to be preserved. The marked-up limits of clearing shall be maintained for at least the duration of clearing and earthworks.	Refer to Section 7.3
9.7 Vegetation Management g)	Vegetation clearing is to be conducted in a stage approach (i.e. vegetation and fauna assessment and/or removal or relocation, vegetation removal, soil surface stabilisation, revegetation) so that the minimum area of ground is exposed at any one time.	Refer to Section 7.5
9.7 Vegetation Management h)	Vegetation clearing is to be undertaken in a staged and sequential manner, moving away from environments, such as roads, which may potentially cause injury to fleeing fauna.	Refer to Section 7.5
9.7 Vegetation Management i)	Dispose of felled timber in consultation with the landowner and occupier. Vegetation residues should not impact on downstream water flow or quality or the easement land use. Vegetation is not to be place where it may increase any fire hazard and impact on Powerlink assets in the event of a fire.	Refer to Section 7.7
9.7 Vegetation Management j)	Any required permits must be obtained for burning cleared vegetation from the local fire warden and/or local council, and Powerlink. Permits must be obtained and provided to Powerlink for review prior to any burning.	Refer to Section 7.7
9.7 Vegetation Management k)	The felling of large trees that may cause damage to protective bank vegetation may be stem injected and left standing providing there are no additional safety risks.	Refer to Section 7.7

Ref	Requirement	Where addressed
9.7 Vegetation Management l)	Where located near watercourses, stockpiles will be made on the downstream side of the centreline of the transmission line. Stockpiles will have gaps between them of the sufficient width to permit the safe passage of stock and vehicles. Such gaps will be spaced at no more than 50 m intervals.	Refer to Section 7.7
9.7 Vegetation Management m)	Stockpiled material will be located at least 50 m clear of all drains, watercourses or their flood banks so as to prevent any obstruction to water flow and 10 m clear of standing timber, scrub or undergrowth, or as directed.	Refer to Section 7.7
9.8 Biosecurity		Refer to Biosecurity Management Plan
9.9 Herbicide Distribution		Refer to Biosecurity Management Plan

3.2 Reference documents

This plan forms part of the CEMP which is a living document and will be updated as required where the scope of works is amended or when a subsequent risk has been identified. All changes will be agreed to by the project key stakeholders and updated by the environmental team. The following sub plan should be read in conjunction with the following regulatory submissions, granted approvals and project specific documents.

Table 3 Reference Documents

Document title	Document ID / Relevant Sections
CopperString 2.0, Draft Environmental Impact Statement, Volume 2 Chapter 7, Flora and fauna	All sections
CopperString 2.0, Draft Environmental Impact Statement, Volume 3 Appendix P Ecological assessment	All sections
CopperString 2.0, Draft Environmental Impact Statement, Volume 3 Appendix Q Framework and environmental management plan	Sections 3.1.6, 3.1.7 and 3.1.8
CopperString 2.0, Supplement to the Draft Environmental Impact Statement, Volume 4	Sections 4.3 and 4.4 Appendices E, F and G
CopperString Project, Coordinator – General's evaluation report on the environmental impact statement, September 2022	Sections 5.2 and 6, Appendix 2 and Appendix 4
Environment Protection and Biodiversity Conservation approval (EPBC 2019/8416)	Sections 6, 7.1, 7.3, 7.7 and 9 Appendix B
CopperString2032, Powerlink – HSE Specification for Contractors and Suppliers, version B	CSPW-HSW-SPE-M8-000001 Section 9
Construction Environmental Management Plan	9310-JV-PLN-CEM-0003
Regulatory Approvals Plan	9310-JV-PLN-RAP-0039
Biosecurity Management Plan	9310-JV-PLN-BIO-0035
Rehabilitation Management Plan	9310-JV-PLN-REP-0037
Field Development Plan	9310-JV-PLN-FDP-0038
Biodiversity Offsets Management Strategy	Powerlink Queensland
Site Environmental Plan (template)	UGLMS-4-2138

Document title	Document ID / Relevant Sections
Environmental Management Plan Template	UGLMS-4-2174, Version 4
Environmental Inspection Weekly Checklist (Form)	UGLMS-4-1549, Version 8
Environmental Monitoring Instructions (Knowledge)	UGLMS-5-1229 Version 2.0
Flora and Fauna Management (Procedure)	UGLMS-131-548
Manage Flora and Fauna (Procedure)	CMS MSID-2-280
Permit to Clear Land or Vegetation (Tool)	CMS MSID-4-363
Risk Tolerability Framework for Environment Management (Knowledge)	CMS MSID-5-1162

4. Flora and Fauna Management Plan

4.1 Management plan purpose

This Flora and Fauna Management Plan addresses flora and fauna management on the project and the management of potential impacts to the environment and/or community.

Activities conducted on the project that have the potential to impact upon flora and fauna are provided below.

Table 4 Hazards and Impacts – Flora and Fauna Management

Project Hazard	Potential Environmental Impact
Clearing and grubbing	Loss of native vegetation, including threatened ecological communities Loss of habitat, including threatened and listed migratory fauna species habitat Loss of threatened flora species Direct injury and mortality of fauna (including vehicle strike) Loss of connectivity for protected and threatened flora and fauna species and populations with the degradation of wildlife and habitat corridors
Works in and around watercourses	Changes in water quality, aquatic habitat loss and instream barriers to movement of fauna
Noise, vibration and light	Indirect impacts to threatened flora species
General earthworks and disturbance of soils	Erosion and mobilisation of sediment resulting in loss of habitat Direct injury and mortality of fauna (including vehicle strike)
Vehicle movements	Invasion and spread of weeds, pests, pathogens, and disease

4.2 Management plan objectives

- Avoid or minimise impacts from Project activities to terrestrial and aquatic flora and fauna (and fauna habitat) and ecological communities

4.3 Performance/ target criteria

- Vegetation clearing is conducted in accordance with the performance requirements of the *Planning Act 2016*
- No permanent disturbance to flora or fauna outside of the Project area (easement, CEV hut, access tracks and substation sites) except where approved for construction access
- All necessary statutory approvals are obtained prior to construction

5. Existing Environment

CopperString 2032 (the project) is located in northern Queensland and covers approximately 1,060 km from south of Woodstock in the east to Mount Isa in the west and Cannington Mine and Phosphate Hill Mine in the south. The extensive size and linear nature of the Project means it intersects large areas of land, crossing six bioregions and six major catchments. While much of the land intersected by the Project is devoted to pastoral land uses and has been subject to varying levels of existing impact from grazing, weed and pest infestation, land clearance and erosion, areas of higher ecological value persist.

An ecological assessment was completed for the project as part of the Environmental Impact Statement, with the study area assessing a 5 km corridor (up to 2.5 km either side of the corridor selection). The corridor intersects six bioregions (generally from east to west): the Brigalow Belt (BRB), Einasleigh Uplands (EIU), Desert Uplands (DEU), Mitchell Grass Downs (MGD), Gulf Plains, (GUP) and Northwest Highlands (NWH) bioregions.

The following five Regional Ecosystems have also been identified within the corridor which are Of Concern polygons (as homogenous or mixed polygons) under the *Vegetation Management Act 1999*:

- 1.9.9 *Acacia cambagei* low woodland on clays developed on Cambrian limestones
- 1.11.7 *Acacia cambagei* low woodland on metamorphic hills
- 2.3.43 *Sporobolus mitchellii* +/- *Cyperus bifax*, *Astrebla elymoides*, *Chenopodium auricomum* tussock grassland on seasonally inundated alluvial plains and drainage depressions
- 9.3.4 Permanent or seasonal wetlands frequently fringed by narrow bands of trees and shrubs including *Eucalyptus spp*. on alluvial plains
- 10.4.7 *Casuarina cristata* open woodland on Cainozoic Lake beds.

The ecological assessment also identified 23 conservation significant species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and/or *Nature Conservation Act 1992* and 8 additional migratory bird species listed under the EPBC Act that were confirmed present or considered likely to occur:

- MNES conservation significant species:
  - Eucalyptus raveretiana – confirmed present
  - *Livistona lanuginosa* – confirmed present
  - *Acacia crombiei* – likely to occur
  - Squatter pigeon (southern) (*Geophaps scripta scripta*) – confirmed present
  - Koala (*Phascolarctos cinereus*) – confirmed present
  - Black throated-finch (*Poephila cincta cincta*) – confirmed present
  - Julia Creek dunnart (*Sminthopsis douglasi*) – confirmed present
  - White-throated needletail (*Hirundapus caudacutus*) – likely to occur
  - Red goshawk (*Erythrotriorchis radiatus*) – likely to occur
  - Night parrot (*Pezoporus occidentalis*) – likely to occur
  - Painted honeyeater (*Grantiella picta*) – likely to occur
  - Australian painted-snipe (*Rostratula australis*) – likely to occur
  - Ornamental snake (*Denisonia maculata*) – likely to occur
  - Plains death adder (*Acanthophis hawkei*) – likely to occur
  - Grey falcon (*Falco hypoleucos*) – likely to occur
- MNES migratory species:
  - Glossy ibis (*Plegadis falcinellus*) – confirmed present
  - Caspian tern (*Hydroprogne caspia*) – confirmed present
  - Oriental pratincole (*Glareola maldivarum*) – confirmed present
  - Marsh sandpiper (*Tringa stagnatilis*) – confirmed present

- Wood sandpiper *(Tringa glareola*) – confirmed present
- Latham's snipe (*Gallinago hardwickii*) – likely to occur
- Gull-billed tern (*Gelochelidon nilotica*) – likely to occur
- Fork-tailed swift (*Apus pacificus*) – likely to occur
- White-throated needletail (*Hirundapus caudacutus*) – likely to occur

- MSES conservation significant species (only):
  - Eucalyptus nudicaulis – confirmed present
  - *Acacia armitii* – confirmed present
  - Purple-necked rock-wallaby (*Petrogale purpureicollis*) – confirmed present
  - Short-beaked echidna (*Tachyglossus aculeatus*) – confirmed present
  - Vine thicket fine-lined slider (*Lerista cinerea*) – confirmed present
  - Northern leaf-nosed bat (*Hipposideros stenotis*) – likely to occur
  - Common death adder (*Acanthophis antarcticus*) – likely to occur.

The project corridor does not intersect any national parks.

A total of 12 restricted invasive weed species were recorded within the project corridor during the field surveys. Past field surveys reported the presence of 43 exotic species within the study area, including five species listed as Weeds of National Significance (WoNS).

6. Clearing Limits

Clearing for construction of the project will be in accordance with the impacts approved under the EPBC approval, condition 2 and the Coordinator Generals' Recommended Requirement B17(c). Approved impacts to protected matters are summarised in Table 5. The project will not clear more than amount specified in Table 5.

Table 5 Approved impacts to threatened species habitat

Common Name	Scientific Name	EPBC conservation status	NCA conservation status	Area of habitat impacted (ha)
Southern Black-throated Finch	*Poephila cincta cincta*	Endangered	Endangered	663.87 (breeding habitat) 42.03 (foraging habitat)
Squatter Pigeon	*Geophaps scripta scripta*	Vulnerable	Vulnerable	42.05 (breeding habitat) 8.77 (foraging habitat)
Koala	*Phascolarctos cinereus*	Vulnerable	Vulnerable	393.21
Night Parrot	*Pezoporus occidentalis*)	Endangered	Endangered	112.57 (breeding habitat) 195.73 (foraging habitat)
Australian Painted Snipe	*Rostratula australis*	Endangered	Endangered	219.14
Painted Honeyeater	*Grantiella picta*	Vulnerable	Vulnerable	945.57
Julia Creek Dunnart	*Sminthopsis douglasi*	Vulnerable	Vulnerable	243.28

Common Name	Scientific Name	EPBC conservation status	NCA conservation status	Area of habitat impacted (ha)
Ornamental Snake	*Denisonia maculata*	Vulnerable	Vulnerable	69.82
Plains Death Adder	*Acanthophis hawkei*	Vulnerable	Vulnerable	121.78
Purple-necked rock wallaby	Petrogale purpureicollis		Vulnerable	90.77

7. Controls Used to Manage Flora and Fauna

Proposed vegetation clearing activities will be undertaken in accordance with existing permits and approvals and relevant federal, state, and local government requirements (refer to Section 6). Where proposed vegetation clearing activities are not in accordance with existing permits and approvals additional assessment will be undertaken by a suitably qualified person and any subsequently identified required approvals and/or offsets will be obtained prior to undertaking vegetation clearing activities

7.1 Pre-clearing surveys

Pre-clearing surveys will be undertaken by Powerlink Queensland up to 12 months prior to the commencing of clearing works. These surveys will be undertaken in stages and are required to:

- Comply with the requirements of the *Guidelines for biological survey and mapped data* (Department of the Environment and Energy, 2018) and *Guide to providing maps and boundary data for EPBC Act projects* (Department of Agriculture, Water, and the Environment, 2021)
- Survey and map threatened species breeding and foraging habitat present, using the criteria within the EPBC Approval definitions if applicable
- Identify threatened flora and/or fauna species, Regional Ecosystems, and habitat present
- Identify and map weeds species present.

Following the completion of the survey a pre-clearance report will be prepared for each work area. Survey elements will also be recorded as spatial data and provided to the JV using agreed symbology and formatting.

Areas of threatened species breeding, and foraging habitat recorded during the survey will be compared against the approved areas of impact in Table 5 using the Disturbance Drawdown Register (refer to the Field Development Plan).

7.2 Species management program

Where pre-clearing surveys identify the works may impact upon actual or potential breeding places of protected animals (extinct in the wild, critically endangered, endangered, vulnerable, near threatened (EVNT), special least concern, colonial breeder or least concern) a Species Management Program (SMP) will be developed and lodged with the Department of Environment and Science for approval.

There are generally two types of SMP's approved under the *Nature Conservation (Animals) Regulation 2020*:

- A High-Risk SMP is used for:
  - Least concern animals that are colonial breeders, and therefore whose broader populations are at greater risk from the impacts of events at a single location
  - Special least concern animals (as prescribed in the Nature Conservation (Animals) Regulation 2020)
  - Near threatened, Vulnerable, Endangered, Critically Endangered, or Extinct in the Wild Animals (as prescribed in the Nature Conservation (Animals) Regulation 2020)

- A Low Risk SMP is used for
  - Least concern animals (that aren't colonial breeders).

A register of SMPs that have been developed for the project is included in Appendix B.

7.3 Rapid fauna assessments

Rapid Fauna Assessments will be undertaken by a suitably qualified wildlife officer or ecologist ten days prior to the commencement of clearing and will include:

- Demarcation of all habitat trees, including known and potential hollow bearing trees (HBT), trees with nests, dreys and termitaria likely to be occupied by fauna and key habitat resources such as hollow logs or large rocks
- Demarcation of high conservation significant areas with flagging or fencing
- Identification of Red Goshawk nests
- Identification of any emergent weed matter not previously treated
- A check to ensure exclusion zones have been delineated and any biodiversity assets to be retained are marked.

The outcomes of the Rapid Fauna Assessments will be recorded in specific reports for each survey. Any additional mitigation measures identified in the survey reports will be incorporated into the environmental work method statement (EWMS) and relevant Site Environment Plan (SEPs) prior to the commencement of any construction work.

Clearing plant and equipment will be fitted with a GPS which shows the project study area and clearing boundary to alert operators when they are close to or outside the boundary. The clearing boundary will also be shown on Site Environment Plan, discussed at pre-starts and/or toolbox talks and regularly inspected.

In some circumstances (i.e. koala habitat) targeted surveys will be undertaken in the night/s preceding clearing, involving nocturnal active searches (spotlighting).

Habitat features and resources identified during the rapid fauna assessments, e.g., large woody debris, tree hollows, logs, rocks, will be relocated prior to the commencement of construction to facilitate the works.

7.4 Fauna capture and handling

Fauna capture and handling will follow the procedure outlined in Appendix C. Fauna will be released into areas of suitable habitat as close as possible to their point of capture and, if necessary, appropriate property access will be arranged.

Hollow-dependent arboreal mammals will be relocated into a habitat features and other resources relocated prior the commencement of clearing, whilst other species will be released in areas where there is refuge habitat appropriate for their ecological requirements.

Records will be kept of all pre-clearing surveys and Rapid Fauna Assessments, and for each habitat tree removed. Data collected on captured fauna will include species, number of individuals, sex, age and general health or type of feature relocated. Further detail on this procedure is provided in the Fauna Handling and Rescue Procedure (Appendix C). Records will be kept on fauna mortality, injury, treatment, and release sites (including the GPS locations).

7.5 Vegetation clearing

Prior to any disturbance, clearing or grubbing activities a Permit to Clear (Appendix F) will be developed and approved by the Project Environment Representative (or delegate). An Environmental Work Method Statement for Clearing and Grubbing will apply to the project works (Refer to Appendix E).

A Pre-Clearing Inspection Checklist will also be completed to confirm:

- Permit to Clear is approved
- Exclusion zones are established
- Weed infested areas are delineated

- A suitably qualified fauna spotter catcher has conducted a search for wildlife that may need to be removed and relocated (see below).

Immediately prior to vegetation clearing, a pre-clearance ecological survey will be completed by a suitably qualified fauna spotter catcher. Clearing will be undertaken using the 'two stage process', specifically:

Stage 1 - Non-habitat tree removal

When vegetation, that may provide habitat for native fauna, is proposed to be removed the area will be surveyed prior to clearing by a suitably qualified fauna spotter catcher, to:

- Obtain updated information on fauna and fauna habitat resources present
- Capture and relocate non-mobile fauna, such as reptiles and frogs and key habitat features such as active bird nests.

Stage 2 – Habitat tree removal

Habitat trees (HBT) will be retained for 48 hours, or two nights, after stage 1 clearing is completed.

The equipment used to fell trees will be appropriately sized to handle the majority of trees on-site and the operator skilled in removing habitat trees and the two-stage clearing procedure. The fauna spotter catcher will discuss the method of felling (i.e. orientation, equipment etc) with the operator to ensure there is a balance between operator safety and animal welfare.

Vegetation clearing will be undertaken in a staged and sequential manner, moving away from environments, such as roads, which may potentially cause injury to fleeing fauna.

Once felled, HBT will be inspected carefully by fauna spotter catchers and if present fauna would be captured, processed and, if healthy, relocated.

Injured fauna will be taken to a local vet for treatment.

7.6 Unexpected threatened species finds procedure

If a threatened species or threatened ecological community is unexpectedly encountered during construction activities, site personnel will follow the Unexpected Threatened Species Finds Procedure outlined in Appendix D.

7.7 Flora and fauna management controls

Controls that are adequate to minimise impacts to flora and fauna will be implemented before any relevant works commence. Elimination of the hazard is the first preference of control, followed by engineering, then administrative controls. Typical controls used on this project include:

Table 6 Flora and Fauna Management Controls

Ref	Control	Accountability	Source
General			
FF1	Training will be provided to all project personnel, including relevant sub-contractors on flora and fauna requirements from this plan through inductions, toolboxes, and targeted training. This training would include: • Identification of threatened species and threatened habitat • Key threats to flora and fauna • Responsibility with respect to minimising the risk of fauna injury or mortality The importance of following the clearing, translocation and rehabilitation protocols would also be made clear for any personnel that require access to the site.	Environmental Site Representative Project Engineer	EPBC Condition 1 Manage Flora and Fauna (CPBEMS) Flora and Fauna Management (UGLEMS)

Ref	Control	Accountability	Source
FF2	Any works required outside the study area will be referred to the Environmental Site Representative for advice on further assessment and approval requirements. Works required outside the study area will occur in previously disturbed areas (i.e., Category X vegetation) and areas that are not mapped as high risk for protected plants where possible, with relevant approvals gained before commencing disturbance works.	Project Manager	EPBC Condition 1
FF3	In the event that threatened species or threatened ecological communities are unexpectedly identified during construction the Unexpected Threatened Species Finds Procedure (Appendix D) will be followed.	Supervisor	Best Practice Manage Flora and Fauna (CPBEMS)
FF4	Environmental work method statements would be prepared for specific activities that pose significant environmental risks, including vegetation clearing. Environmental work method statements would ensure sound environmental practices are implemented to minimise the risk of environmental incidents or system failures, in accordance with the CEMP.	Senior Project Engineer	Best Practice
FF5	A map (GIS format) would be prepared and be kept up to date, clearly showing the locations of: • Habitat trees • High conservation significant areas • Areas of remnant vegetation impacted by the works • Exclusion zones. Site Environment Plans will be incorporated into environmental work method statements, daily toolbox talks (where relevant) and provided to all personnel that require access to the exclusion zones.	Environmental Site Representative	HSE Specification Flora and Fauna Management (UGLEMS) Manage Flora and Fauna (CPBEMS)
FF6	The Field Development Plan / Disturbance Procedure will be implemented during detailed design to avoid and minimise direct impact environmentally sensitive areas, where possible, including: • Areas of high ecological value through the process of corridor realignment or spanning across these areas of higher ecological value, terrain constraints and remnant vegetation • Watercourses by transmission towers, implementing buffer distances, sighting towers and taller towers so the alignment can completely span waterways and riparian vegetation • Key localised ecological resources such breeding, nesting or refuge sites for conservation significant species • Sensitive areas mapped as wetlands and semi-evergreen vine thicket.	Design Manager	EIS Commitments C51, C52, C53, C54, C58, C75 and C149
FF7	The detailed design will include diverters on spans as required which will be installed during construction.	Design Manager Project Manager	HSE Specification
FF8	The detailed design will include fauna friendly anti-climbing barriers on towers where wildlife interactions have been identified or are likely.	Design Manager Project Manager	HSE Specification

Ref	Control	Accountability	Source
FF9	All external lighting will be installed and maintained to accord with Australian standards and shielded to minimise light spill to the surrounding environment.	Design Manager (design) Supervisor (construction)	Recommended Requirement 32
FF10	Should apiarists consider placement of beehives inside the easement, advice on suitable techniques to shield beehives from electric field generated by the transmission line will be provided.	Design Manager	Commitment C166
FF11	Vehicles will be restricted to approved and mapped access tracks and only those vehicles required for the safe, efficient, and essential construction activities will access the work area.	Supervisor	HSE Specification
FF12	The project will not disturb a Protected Area, World Heritage Area or State Forest without the required approval and authorisation.	Project Manager	HSE Specification
FF13	Detailed site specific erosion and sediment control plans will be prepared in accordance with the Erosion and Sediment Control Plan to minimise the project's impacts of changes in water quality on aquatic flora and fauna.	Environmental Site Representative	Best Practice
FF14	Indirect impacts of dust and noise on flora and fauna will be mitigated in accordance with the Air Quality Management Plan and Noise and Vibration Management Plan.	Project Manager	Best Practice
Vegetation Clearing, Protection and Management			
FF15	The clearing of native vegetation will be minimised with the objective of reducing impacts to remnant vegetation, mature vegetation and any threatened species or regional ecosystems, where feasible and reasonable. Ground disturbance will be minimised wherever practical by using existing cleared areas for construction laydown/delivery areas and material stockpiles.	Supervisor	EPBC Condition 1 Recommended Requirement B16(a) EIS Commitment C35 and C77 HSE Specification Flora and Fauna Management (UGLEMS) Manage Flora and Fauna (CPBEMS)
FF16	A pre-clearing process will be implemented in accordance with Section 7.1 and 7.3. It will include: • Pre-clearing surveys of threatened flora and/or fauna species, Regional Ecosystems and habitat present, including breeding and foraging habitat, • Rapid Fauna Assessments by a suitably qualified wildlife officer or ecologist to identify fauna and key habitat resources present, demarcation of exclusion zones and high conservation significant areas, and weeds present.	Environmental Site Representative	Recommended Requirement B16(b) and (c) EIS Commitment C61 Flora and Fauna Management (UGLEMS)
FF17	Construction equipment will stay within the areas approved for disturbance.	Supervisor	Best Practice
FF18	Trees will be lopped within the clearing zone, in accordance with Australian Standard 4373 Pruning of amenity trees where relevant, in preference to complete removal.	Supervisor	Best Practice

Ref	Control	Accountability	Source
FF19	Within areas where clearing must occur for construction purposes, but not within the footprint of final structures, clearing completely to ground level will be minimised where practical. Slashing of existing vegetation layers will be undertaken, so that the diversity of native plant species retained (and seed bank) is maximised.	Supervisor	Best Practice
FF20	To prevent injury and mortality of fauna during the clearing of vegetation a suitably qualified fauna spotter catcher or ecologist will be present to advise on the staging and sequencing of clearing and ensure risk of injury to, or death of fauna is minimised. Fauna capture and handling will follow the procedure outlined in Appendix C.	Environmental Site Representative	Recommended Requirement B17(e)
FF21	A Biosecurity Management Plan has been developed and will be implemented prior to and during vegetation clearing works.	Environmental Site Representative	Best Practice
FF22	Cleared vegetation will be disposed of in consultation with the landowner and / or occupier. It will: • Not be stacked or pushed against mature trees, habitat trees or tall immature trees that are not required to be cleared from construction impacts • Not obstruct the flow or quality of drains or watercourses or the easement land use • Allow safe passage for stock and vehicles • Not be placed where it may increase any fire hazard and impact on Powerlink assets in the event of a fire. Cleared vegetation will be beneficially used where practical (e.g. for habitat enhancement works, chipped for mulch and reused).	Supervisor	HSE Specification Flora and Fauna Management (UGLEMS)
FF23	The felling of large trees that may cause damage to protective bank vegetation may be stem injected and left standing providing there are no additional safety risks.	Supervisor	HSE Specification
FF24	A “Permit to Light Fire” must be obtained for burning cleared vegetation from the local fire warden, and Powerlink. Permits must be obtained and provided to Powerlink for review prior to any burning.	Senior Project Engineer	HSE Specification
FF25	No equipment, plant, vehicles or materials will be stored within the drip line of a tree	Supervisor	Flora and Fauna Management (UGLEMS)
FF26	All roots greater than 40mm in diameter that require pruning must be cleanly cut and kept moist at all times	Supervisor	Flora and Fauna Management (UGLEMS)
Threatened and Non-Threatened Fauna			
FF27	The measures associated with construction activities identified in the MNES Management Plan will be implemented.	Environmental Site Representative	EPBC Condition 15
FF28	A suitably qualified fauna spotter catcher will be present on site during all vegetation clearing and habitat removal activities to undertake pre-clearance habitat searches and minimise harm to fauna, including through the capture and relocation of threatened mammals (and other fauna species) that may be encountered. Identified habitat trees (such as hollow bearing trees) will be left for at least 48 hours after clearing the non-habitat vegetation to allow fauna to escape. If necessary, fauna may need to be trapped or	Senior Project Engineer	HSE Specification

Ref	Control	Accountability	Source
	captured and relocated to pre-determined habitat identified for fauna release.		
FF29	Impact to protected native fauna will be completed in accordance with any relevant Works Approvals.	Environmental Site Representative	HSE Specification
FF30	Tampering with an animal breeding place may only be carried out in accordance with an approved Species Management Program.	Environmental Site Representative	HSE Specification
FF31	A Damage Mitigation Permit will be required from DES to interfere with wildlife.	Environmental Site Representative	Best Practice
FF32	The project will not clear or impact upon Red Goshawk nests.	Project Manager	EPBC Condition 3
FF33	Construction activities will be planned and occur progressively to minimise the period of time the trench is open and the length of open trench, as far as reasonably practicable. Where a trench remains open overnight or for extended lengths, the ends of the trench left open will be ramped to a gentle incline (<50%) to allow fauna to escape; escape ramps and trench plugs (temporary barriers in the open trench) will be established for every 500 m of an open trench; additional methods may be adopted to create 'ladders' at regular intervals to assist small fauna to exit the trench (e.g. branches, ramped gangplanks, etc.); and/or sawdust filled hessian bags (shelter sites) will be placed intermediate to the escape ramps. At the start of work hours and on a daily basis, construction personnel will inspect the entire open length of the trench for entrapped or injured wildlife. If required, wildlife handlers (e.g. licensed fauna spotter catchers) will be called to site to attend to fauna issues. This monitoring will be undertaken throughout the entire length of the trench regardless of fauna habitat status.	Supervisor	HSE Specification Commitment C63 Flora and Fauna Management (UGLEMS)
FF34	An authorised carer (holding a valid Rehabilitation Permit) will be engaged to care for and rehabilitate injured or orphaned native animals, in accordance with the Fauna Handling and Rescue Procedure (refer to Appendix C).	Environmental Site Representative	HSE Specification
FF35	Domestic pets and animals are prohibited on site during works.	Supervisor	HSE Specification
FF36	A reduced site speed shall be implemented where necessary to reduce fauna / vehicle collisions.	Supervisor	Best Practice
FF37	Travel near dawn or dusk will be minimised by adhering to standard daytime work hours, limit haulage and delivery of materials to the day time and/or minimise the number of vehicles travelling during this period through the use of busses to transport construction personnel	Supervisor	Best Practice
FF38	The use of barbed wire will be avoided and used only where essential to exclude stock from adjoining pastoral activities.	Supervisor	Best Practice
FF39	Fauna will not be fed and direct contact with fauna will be avoided (unless by a suitably qualified person).	Supervisor	Best Practice
Working in waterways			
FF40	Disturbance within the stream channel and to in-stream habitat will be avoided wherever possible. Where disturbance is required, the	Senior Project Engineer	Commitment C62 and C76

Ref	Control	Accountability	Source
	footprint will be minimised, with riparian vegetation and the stumps of large habitat trees retained.		
FF41	Temporary watercourse crossings will be required during construction to facilitate equipment and personnel access to the construction works. Where a waterway must be traversed existing access tracks and areas of existing disturbance will be utilised, wherever possible, or alternatively the crossing will comply with Accepted development requirements for operational work that is constructing or raising waterway barrier works (Department of Agriculture and Fisheries, 2018). Key requirements for these temporary works include: • The dimensions of the temporary barrier will be limited to the minimum practicable for the site and purpose • The method of draining the water will not cause fish to become trapped or stranded or have detrimental impacts on the wellbeing of fish • Required approvals / permits will be sought prior to the commencement of the work, including a General Fisheries Permit • If there is more than one temporary waterway barrier in the location, the most downstream waterway barrier will be removed first • All waterway barrier material will be removed from within the waterway and disposed of at least 50m away from the waterway • DAF will be notified prior to, but not more than twenty business days before works commences • DAF will be notified post work and within 15 business days of completion of works • Works will not commence during times of elevated flow • Other than spoil deliberately used for re-profiling to restore bed and banks to natural profiles, spoil from excavation will be removed from waterways • All material used in the works will be ASS free or have been treated to accepted standards to prevent movement of sediment, runoff and leachate to fish habitats • Provisions will be made to minimise the risk of fish kills arising from the works e.g. through entrapment of fish upstream or between works.	Project Environmental Representative Senior Project Engineer	Recommendation A8 Commitment C62 and C81
FF42	Key requirements for purple and red waterways: • Works will commence and finish within a maximum time of 180 calendar days.	Senior Project Engineer	Best Practice
FF43	Key requirements for amber and green waterways: • Works will commence and finish within a maximum timeframe of 360 days.	Senior Project Engineer	Best Practice
FF44	Where a waterway must be traversed and the crossing will not comply with the *Accepted development requirements for operational work that is constructing or raising waterway barrier works* (Department of Agriculture and Fisheries, 2018), an Operational Works: Waterway Barrier Works approval will be sought. Where required the project will undertake this works in consultation with the Department of Agriculture and Fisheries.	Project Environmental Representative	Recommendation A8 Commitment C62 and C81

Ref	Control	Accountability	Source
FF45	Pre- and post-works surveys of creeks (including soil profiles) will be undertaken to ensure the creek profile is restored.	Senior Project Engineer	Best Practice

FF46	Watercourse riparian vegetation clearing will be undertaken in accordance with the *Riverine Protection Permit Exemption Requirements WSS/2013/726 Version 2.01* (former Department of Natural Resources, Mines and Energy, 2019):
	• Clearing at each watercourse crossing is to be minimised where practical.
	• At each watercourse clearing limits are imposed:
	  ○ Clearing less than 0.5 ha of Category B regulated vegetation that is a least concern RE
	  ○ Clearing less than 0.5 ha of Category R, C or X regulated vegetation.
	If these requirements cannot be met, approval shall be sought under relevant legislation including the *Fisheries Act 1994*.
		Project Environmental Representative	HSE Specification

FF47	Access tracks, stockpiles, and laydown/delivery areas will be located as far as practicable away from important wetlands, waterways, and drainage lines.	Supervisor	Commitment C74
FF48	Following the use of the crossing, the bed and banks of the water will be reinstated to a condition similar to or better than the original condition ensuring that there are no adverse impacts on the aquatic values and where feasible and reasonable, avoid impacts on geomorphic processes.	Supervisor	Best Practice
FF49	All construction materials used for permanent watercourse crossings (rocks and gravel) will to be free of fine particles to minimise turbidity.	Supervisor	Best Practice
FF50	Any instream woody debris removed during construction will be replaced at the completion of the works within the same waterways from which it was removed, where feasible and reasonable.	Supervisor	Best Practice
FF51	Fish that become stranded due to temporary access crossings or construction of temporary or permanent creek diversions must be captured and translocated, in accordance with a General Fisheries Permit (if required).	Project Environmental Representative	Best Practice

FF52	Where the construction of the Works requires the infill of dams or dewatering of waterways a dewatering environmental work method statement will be developed and implemented. The dewatering procedure will:
	• Restrict the initial drawdown of water to a manageable level (approximately 500 mm depth) and provide screening at pump inlets
	• Following initial drawdown, manage the survey, capture and relocation of aquatic fauna, including native fish, turtles, and eels, to nearby recipient sites that are:
	  ○ not directly impacted by your Work; and,
	  ○ part of the same sub catchment so as to avoid the inadvertent dispersal of native vertebrates into unsuitable habitat
	• Contain procedures to euthanise any exotic fish and any other fish that cannot be appropriately identified (native or not).
	A General Fisheries Permit will be obtained prior to the commencement of fish survey and relocation where required.
		Supervisor	Best Practice

Ref	Control	Accountability	Source
Water quality			
FF53	Where located near watercourses, stockpiles will be made on the downstream side of the centreline of the transmission line. Stockpiles will have gaps between them of the sufficient width to permit the safe passage of stock and vehicles. Such gaps will be spaced at no more than 50 m intervals.	Supervisor	HSE Specification
FF54	Stockpiled material will be located at least 50 m clear of all drains, watercourses, or their flood banks so as to prevent any obstruction to water flow and 10 m clear of standing timber, scrub or undergrowth, or as directed.	Supervisor	HSE Specification

8. Monitoring Flora and Fauna Management

The project will undertake the monitoring of flora and fauna management to:

- Ensure compliance with legal and contract requirements
- Determine if a non-conformance has occurred

It is the accountability of the Project Environmental Representative (or delegate) to ensure all monitoring is performed in accordance with the requirements of this plan.

Environmental inspections will be undertaken weekly by the Environmental Advisor with the field Supervisor and will include:

- Identification of non-conformances with this plan and or approval/permit conditions.
- Monitoring of disturbed areas and identification of any areas that have been disturbed without approval
- Integrity of exclusion zone boundaries.

Any non-conformances identified will be managed in accordance with Section 8.4 of the CEMP.

The mitigation and management measures within this document will be reviewed at least every six months, however the following may also trigger a review of this document:

- Results of early works field investigations and any recommendations
- Results of pre-clearance ecology surveys and requirements not identified as existing management measures
- Reportable environmental incidents
- New construction (management) techniques not addressed by the existing environmental management framework
- Changes in the statutory framework
- Additional work scopes where aspects and impacts are not addressed by the existing technical/activity specific/related plans

9. Reporting

Environmental records to be kept on site and made available to Powerlink Queensland or external auditors upon request. This file will contain the following:

- Completed environmental checklists/reports during the construction phase
- Reports of any environmental incidents or non-conformances with the CEMP
- Internal and external environmental audit results.

Should construction work and project related vehicle movements result in the injury or death of an animal, including roadkill, this will be recorded and reported as an incident in accordance with Section 9 of the CEMP and Flora and Fauna Management (UGLEMS)

In the event the unexpected finds procedure is implement and a protected matter is found which is not in included in the EIS, the Project Environmental Representative will notify Powerlink Queensland who will notify Department of Climate Change, Energy, the Environment and Water in accordance with EPBC Condition 4)

Following the completion of construction, the final impact on each MSES will be confirmed in a post-construction audit and reported to the Department of State Development, Infrastructure, Local Government and Planning in accordance with Recommended Requirement B17(i).

10. Plan Review and Control

This plan shall be reviewed on a regular basis but not greater than 12 monthly intervals in accordance with the requirements specified in the:

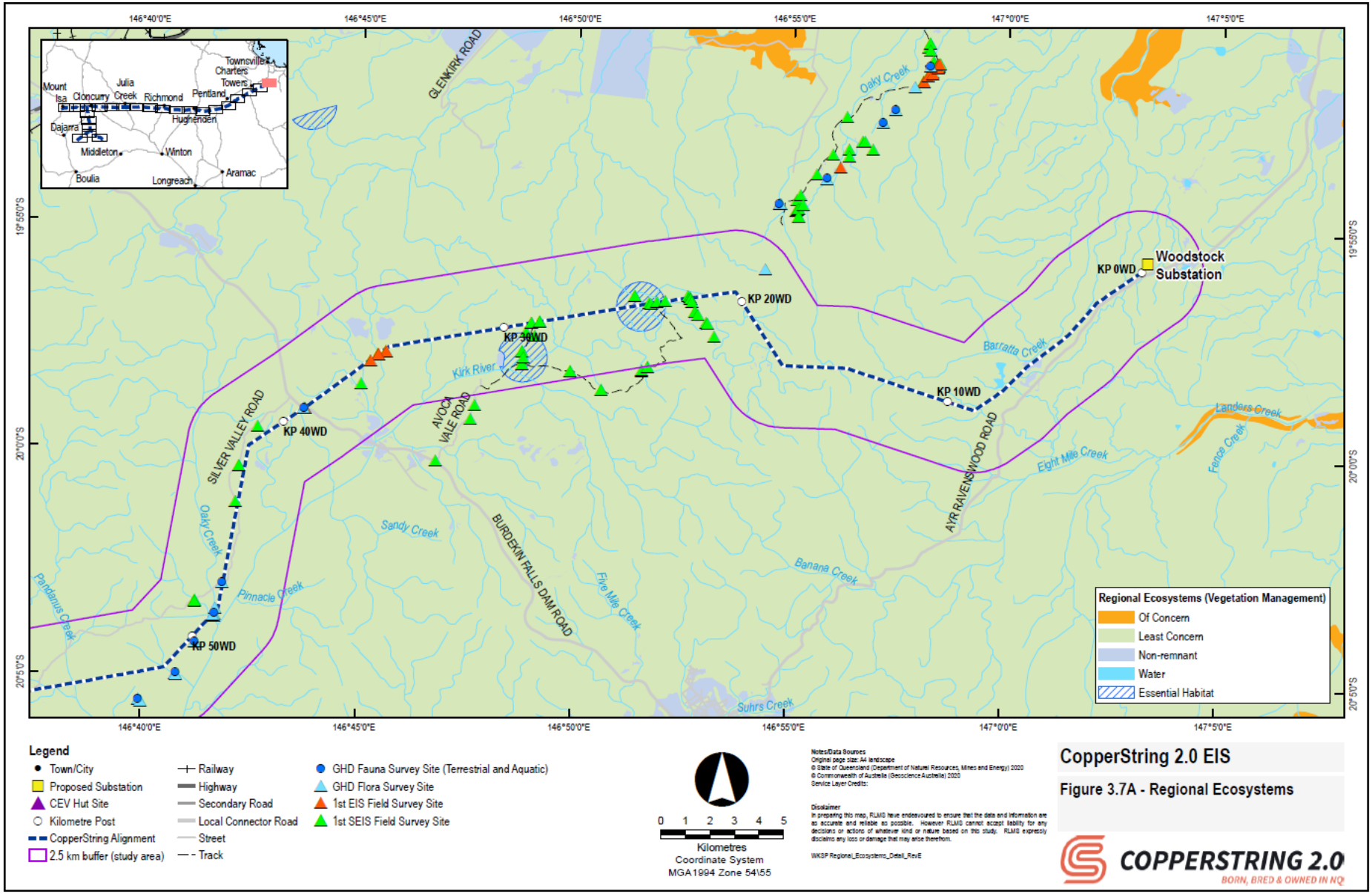
- UBLCPBJV Quality Management System
- CEMP
- CopperString 2032, Powerlink – HSE Specification for Contractors and Suppliers, version B .

All the Project environmental management documents, review (version history) will be uploaded and maintained on InEight or the UGLCPBJV's Document Management System.

11. References

- CopperString 2.0 Environmental Impact Statement (2019)
- CopperString 2.0 Supplement to the Draft Environmental Impact Statement (2022)
- CopperString Project - Coordinator-General's evaluation report on the environmental impact statement (Coordinator General, September 2022)
- CopperString 2032, Powerlink – HSE Specification for Contractors and Suppliers (CSPW-HSW-SPE-M8-000001, version B).

Appendix A Regional Ecosystem mapping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20°5'0"S
Townsville
Charters Towers
Mount Isa
Cloncurry
Julia Creek
Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
GLENKIRK ROAD
Oaky Creek
KP 0WD
Woodstock Substation
KP 20WD
KP 30WD
KP 40WD
KP 50WD
KP 10WD
Kirk River
Barratta Creek
Landers Creek
Fence Creek
Eight Mile Creek
SILVER VALLEY ROAD
AVOCA VALE ROAD
AYR RAVENSWOOD ROAD
BURDEKIN FALLS DAM ROAD
Sandy Creek
Pandanus Creek
Pinnacle Creek
Five Mile Creek
Banana Creek
Suhrs Creek
Regional Ecosystems (Vegetation Management)
Of Concern
Least Concern
Non-remnant
Water
Essential Habitat
Legend
Town/City
Proposed Substation
CEV Hut Site
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Secondary Road
Local Connector Road
Street
Track
GHD Fauna Survey Site (Terrestrial and Aquatic)
GHD Flora Survey Site
1st EIS Field Survey Site
1st SEIS Field Survey Site
0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55
Notes/Data Sources
Original page size: A4 landscape
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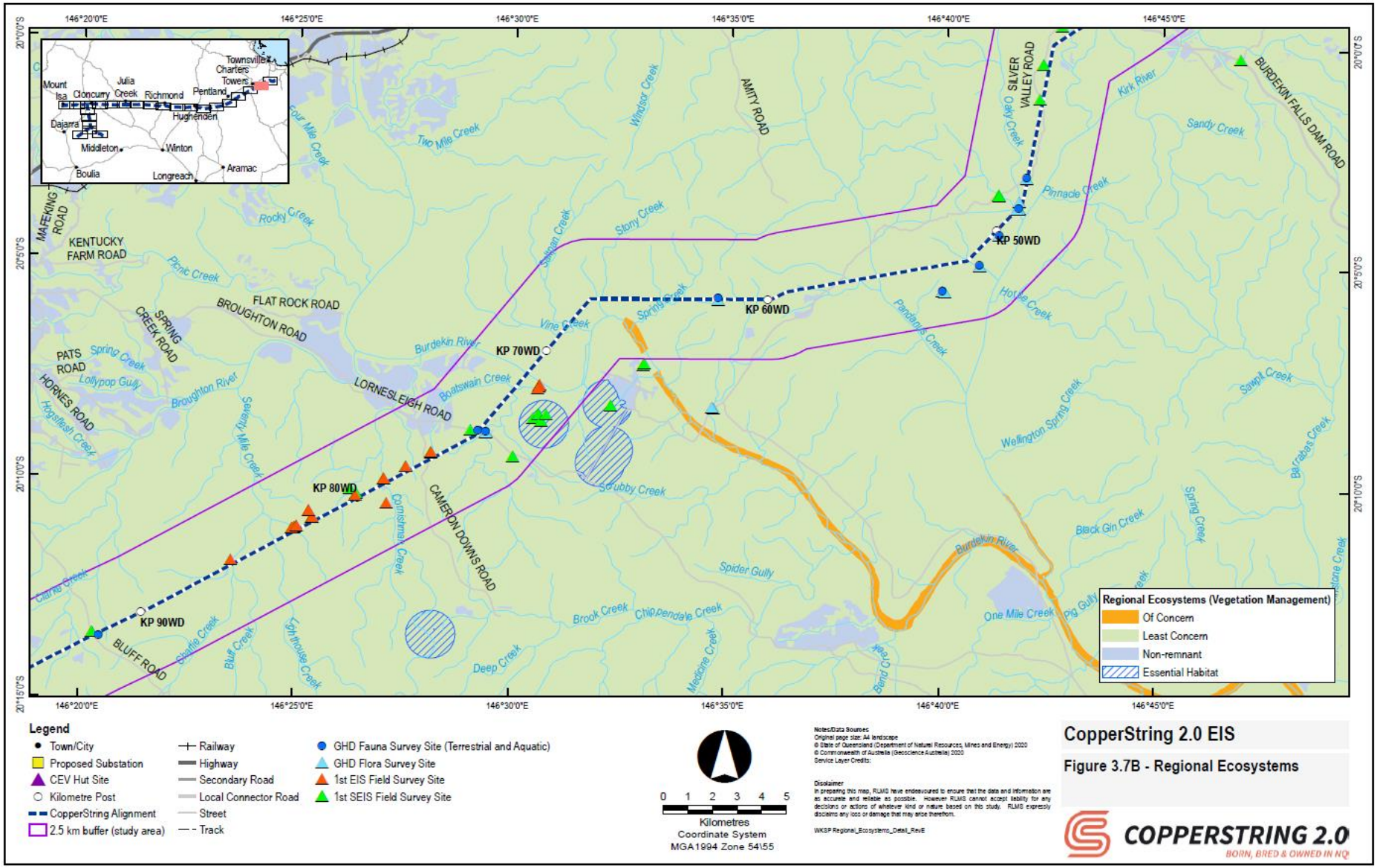
WKSP Regional_Ecosystems_Detail_RevE
CopperString 2.0 EIS
Figure 3.7A - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ


Regional Ecosystems (Vegetation Management)
Of Concern
Least Concern
Non-remnant
Essential Habitat
KP 50WD
KP 60WD
KP 70WD
KP 80WD
KP 90WD
KENTUCKY FARM ROAD
FLAT ROCK ROAD
BROUGHTON ROAD
SPRING CREEK ROAD
PATS ROAD
HORNES ROAD
LORNESLEIGH ROAD
CAMERON DOWNS ROAD
BLUFF ROAD
AMITY ROAD
SILVER VALLEY ROAD
BURDEKIN FALLS DAM ROAD
Legend
Town/City
Proposed Substation
CEV Hut Site
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Secondary Road
Local Connector Road
Street
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GHD Fauna Survey Site (Terrestrial and Aquatic)
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Coordinate System
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CopperString 2.0 EIS
Figure 3.7B - Regional Ecosystems
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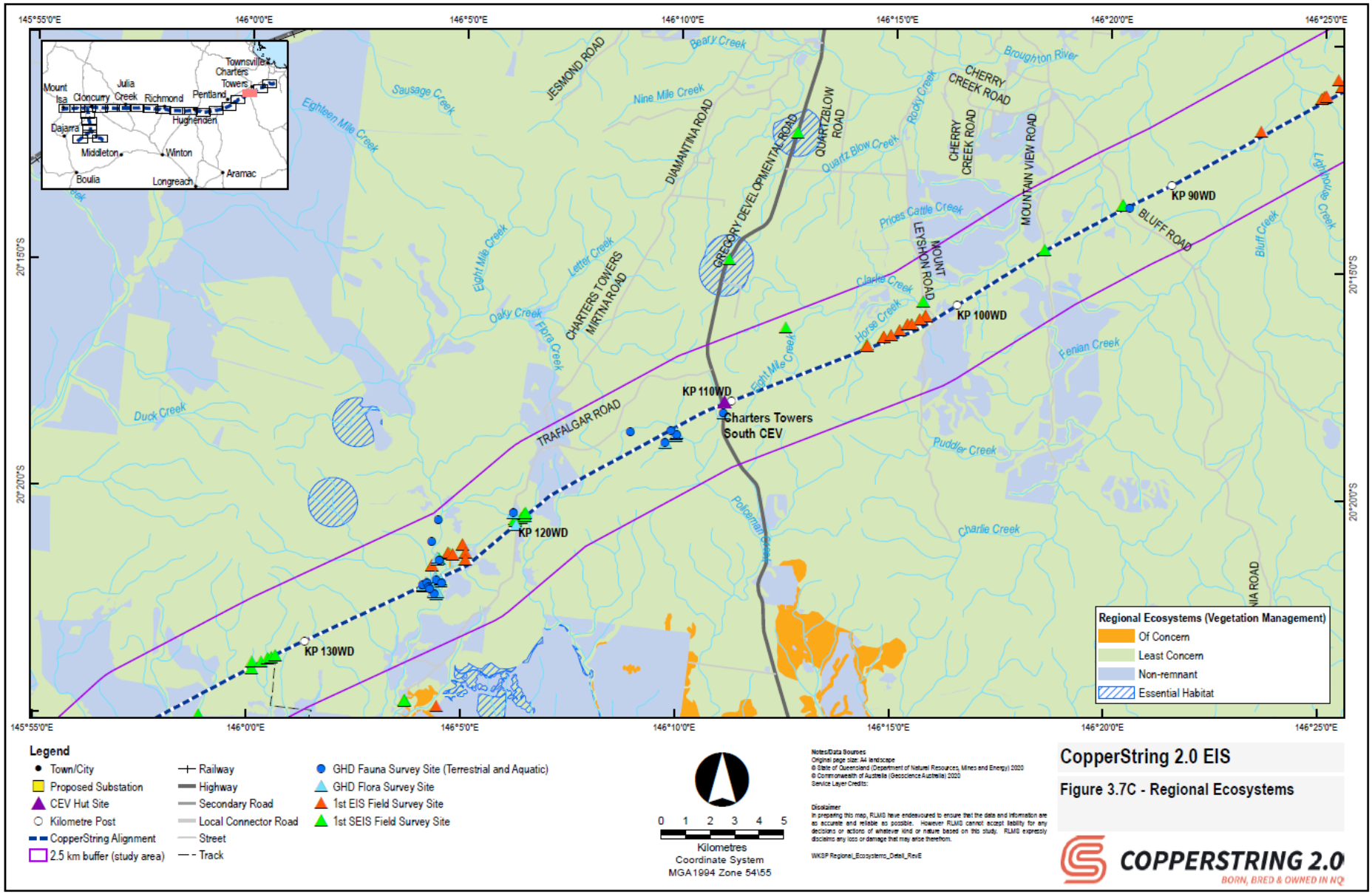
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Townsville
Charters Towers
Mount Isa
Cloncurry
Julia Creek
Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
JESMOND ROAD
Beary Creek
Broughton River
Sausage Creek
Nine Mile Creek
DIAMANTINA ROAD
GREGORY DEVELOPMENTAL ROAD
QUARTZBLOW ROAD
Rocky Creek
CHERRY CREEK ROAD
MOUNTAIN VIEW ROAD
Eighteen Mile Creek
Quartz Blow Creek
Prices Cattle Creek
KP 90WD
BLUFF ROAD
Eight Mile Creek
Letter Creek
CHARTERS TOWERS MIRTNA ROAD
MOUNT LEYSHON ROAD
Clarke Creek
KP 100WD
Oaky Creek
Flora Creek
Horse Creek
Fenian Creek
Bluff Creek
Lighthorse Creek
KP 110WD
Charters Towers South CEV
TRAFALGAR ROAD
Duck Creek
Puddler Creek
Policeman Creek
Charlie Creek
KP 120WD
KP 130WD
Regional Ecosystems (Vegetation Management)
Of Concern
Least Concern
Non-remnant
Essential Habitat
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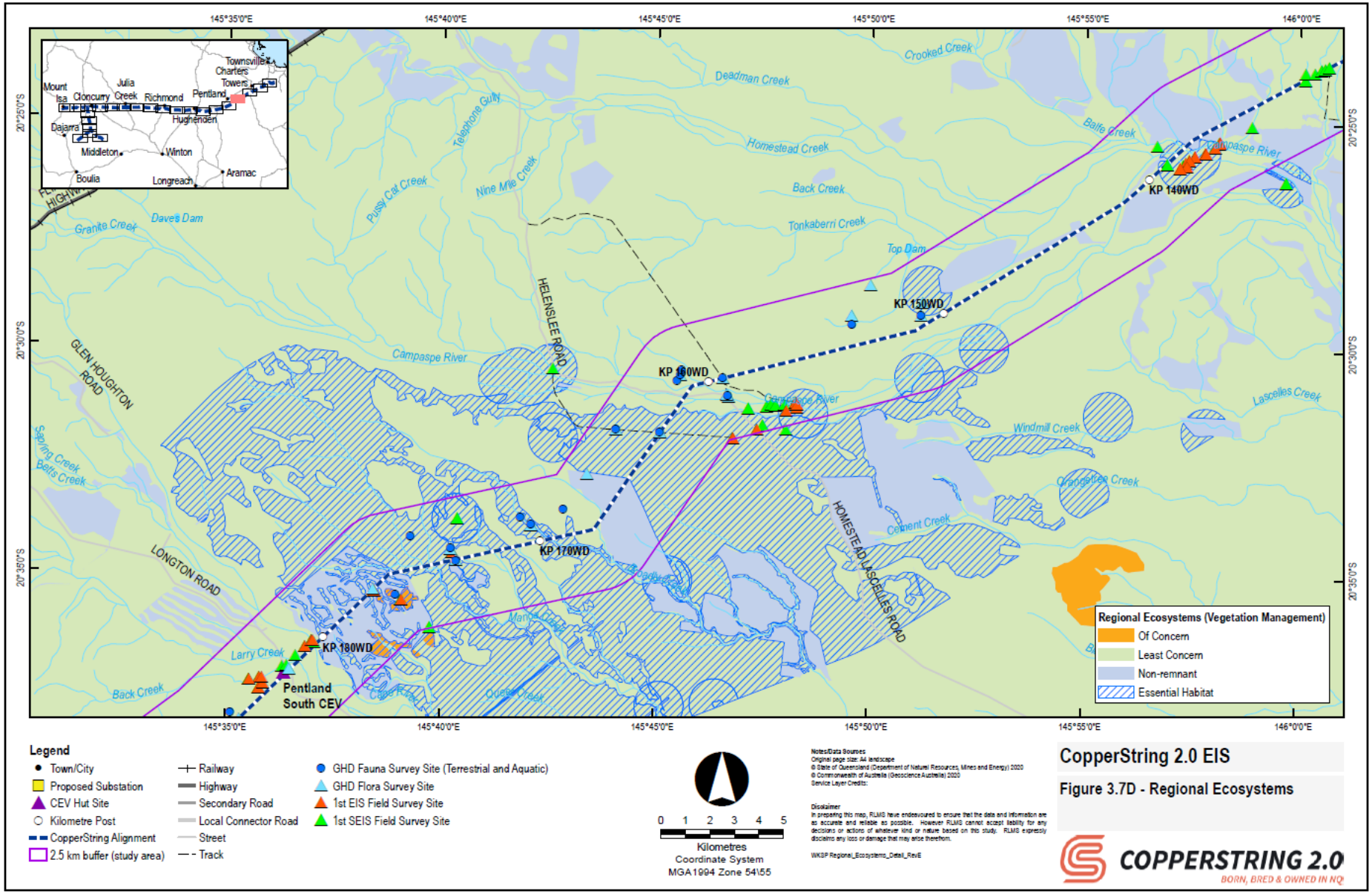
WKSP Regional_Ecosystems_Detail_RevE
CopperString 2.0 EIS
Figure 3.7C - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ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Townsville
Charters Towers
Mount Isa
Cloncurry
Julia Creek
Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
Crooked Creek
Deadman Creek
Telephone Gully
Homestead Creek
Balfe Creek
Campaspe River
Pussy Cat Creek
Nine Mile Creek
Back Creek
Tonkaberri Creek
Top Dam
Granite Creek
Daves Dam
HELENSLEE ROAD
GLEN HOUGHTON ROAD
Campaspe River
Lascelles Creek
Windmill Creek
Sapling Creek
Betts Creek
Orangetree Creek
Cement Creek
HOMESTEAD LASCELLES ROAD
LONGTON ROAD
Larry Creek
Back Creek
Cape River
Queen Creek
KP 140WD
KP 150WD
KP 160WD
KP 170WD
KP 180WD
Pentland South CEV
Regional Ecosystems (Vegetation Management)
Of Concern
Least Concern
Non-remnant
Essential Habitat
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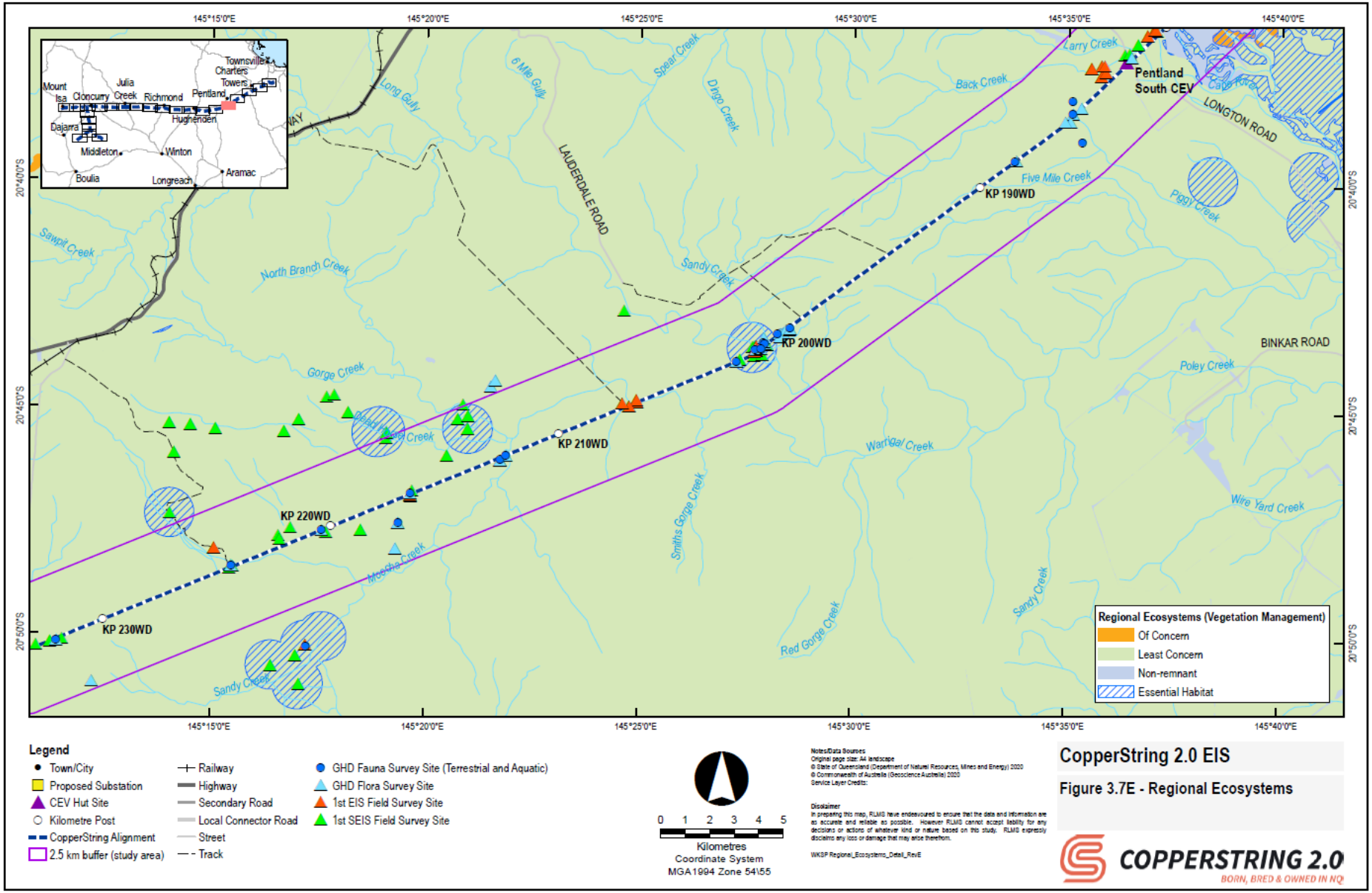
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Townsville
Charters Towers
Mount Isa
Cloncurry
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Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
Pentland South CEV
KP 190WD
KP 200WD
KP 210WD
KP 220WD
KP 230WD
LONGTON ROAD
LAUDERDALE ROAD
BINKAR ROAD
Larry Creek
Back Creek
Spear Creek
Dingo Creek
6 Mile Gully
Long Gully
Five Mile Creek
Piggy Creek
Sandy Creek
Sawpit Creek
North Branch Creek
Gorge Creek
Poley Creek
Warrigal Creek
Wire Yard Creek
Smiths Gorge Creek
Moocha Creek
Red Gorge Creek
Regional Ecosystems (Vegetation Management)
Of Concern
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Highway
Secondary Road
Local Connector Road
Street
Track
GHD Fauna Survey Site (Terrestrial and Aquatic)
GHD Flora Survey Site
1st EIS Field Survey Site
1st SEIS Field Survey Site
0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55
Notes/Data Sources
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WKSP Regional_Ecosystems_Detail_RevE
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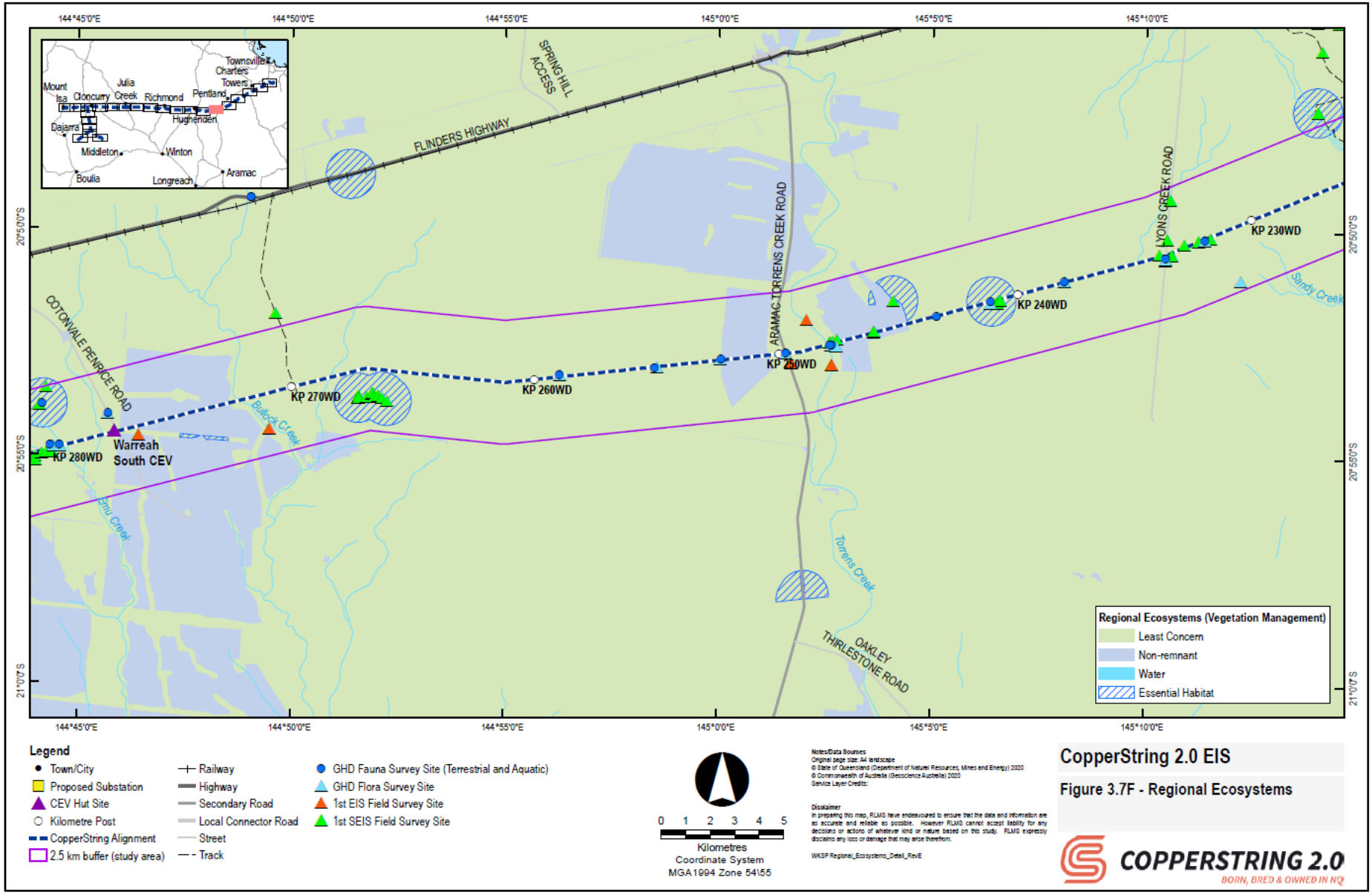
Figure 3.7E - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ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Townsville
Charters Towers
Mount Isa
Cloncurry
Julia Creek
Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
FLINDERS HIGHWAY
SPRING HILL ACCESS
ARAMAC-TORRENS CREEK ROAD
LYONS CREEK ROAD
COTONVALE PENRICE ROAD
OAKLEY THIRLESTONE ROAD
KP 230WD
KP 240WD
KP 250WD
KP 260WD
KP 270WD
KP 280WD
Warreah South CEV
Bullock Creek
Torrens Creek
Sandy Creek
Emu Creek
Regional Ecosystems (Vegetation Management)
Least Concern
Non-remnant
Water
Essential Habitat
Legend
Town/City
Proposed Substation
CEV Hut Site
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Secondary Road
Local Connector Road
Street
Track
GHD Fauna Survey Site (Terrestrial and Aquatic)
GHD Flora Survey Site
1st EIS Field Survey Site
1st SEIS Field Survey Site
0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55
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WKSP Regional_Ecosystems_Detail_RevE
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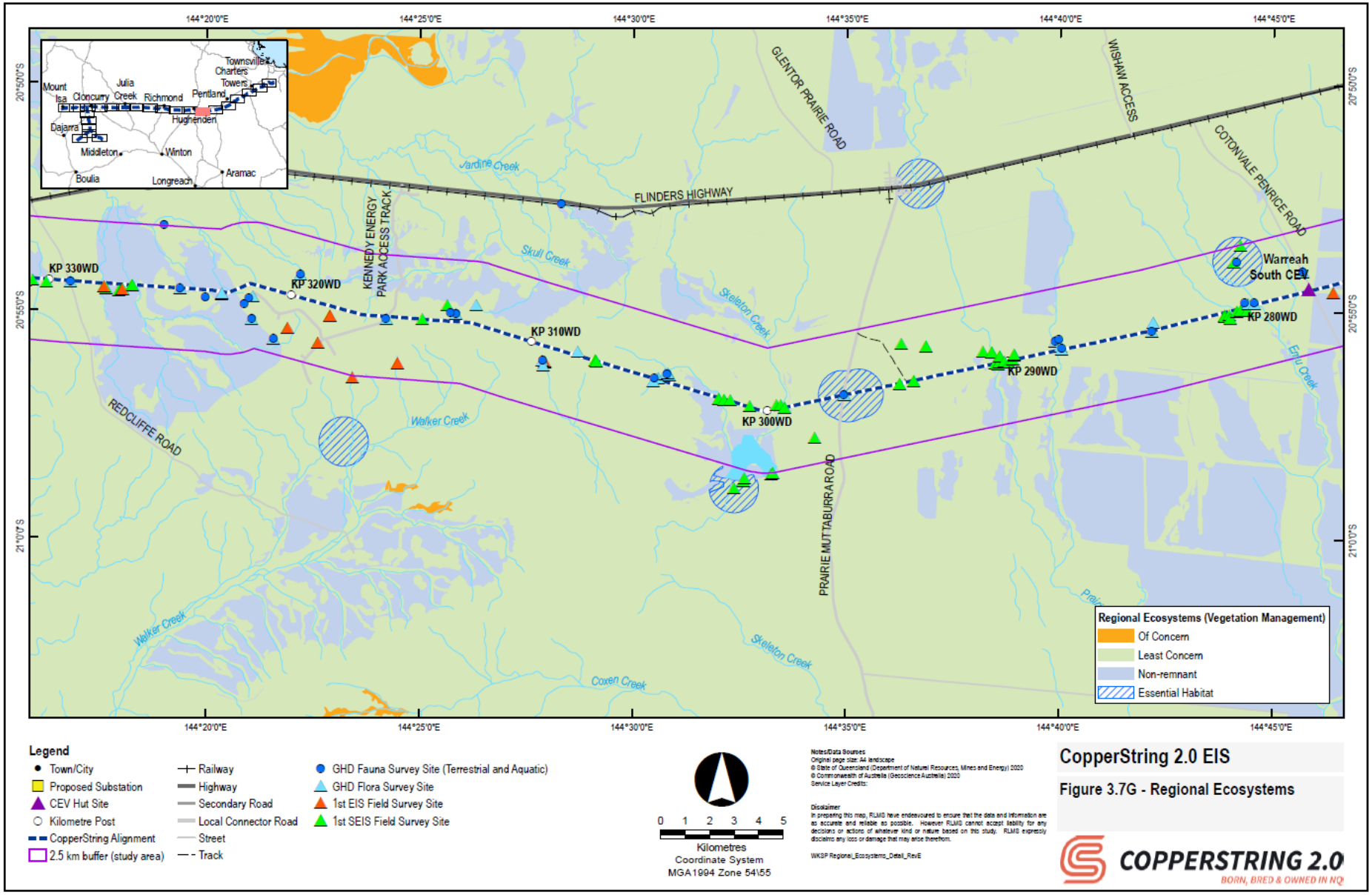
Figure 3.7F - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ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Charters Towers
Mount Isa
Cloncurry
Julia Creek
Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
FLINDERS HIGHWAY
GLENTOR PRAIRIE ROAD
WISHAW ACCESS
COTONVALE PENRICE ROAD
KENNEDY ENERGY PARK ACCESS TRACK
REDCLIFFE ROAD
PRAIRIE MUTTABURRA ROAD
Jardine Creek
Skull Creek
Skeleton Creek
Walker Creek
Coxen Creek
Erlu Creek
KP 330WD
KP 320WD
KP 310WD
KP 300WD
KP 290WD
KP 280WD
Warreah South CEV
Regional Ecosystems (Vegetation Management)
Of Concern
Least Concern
Non-remnant
Essential Habitat
Legend
Town/City
Proposed Substation
CEV Hut Site
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Secondary Road
Local Connector Road
Street
Track
GHD Fauna Survey Site (Terrestrial and Aquatic)
GHD Flora Survey Site
1st EIS Field Survey Site
1st SEIS Field Survey Site
0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55
Notes/Data Sources
Original page size: A4 landscape
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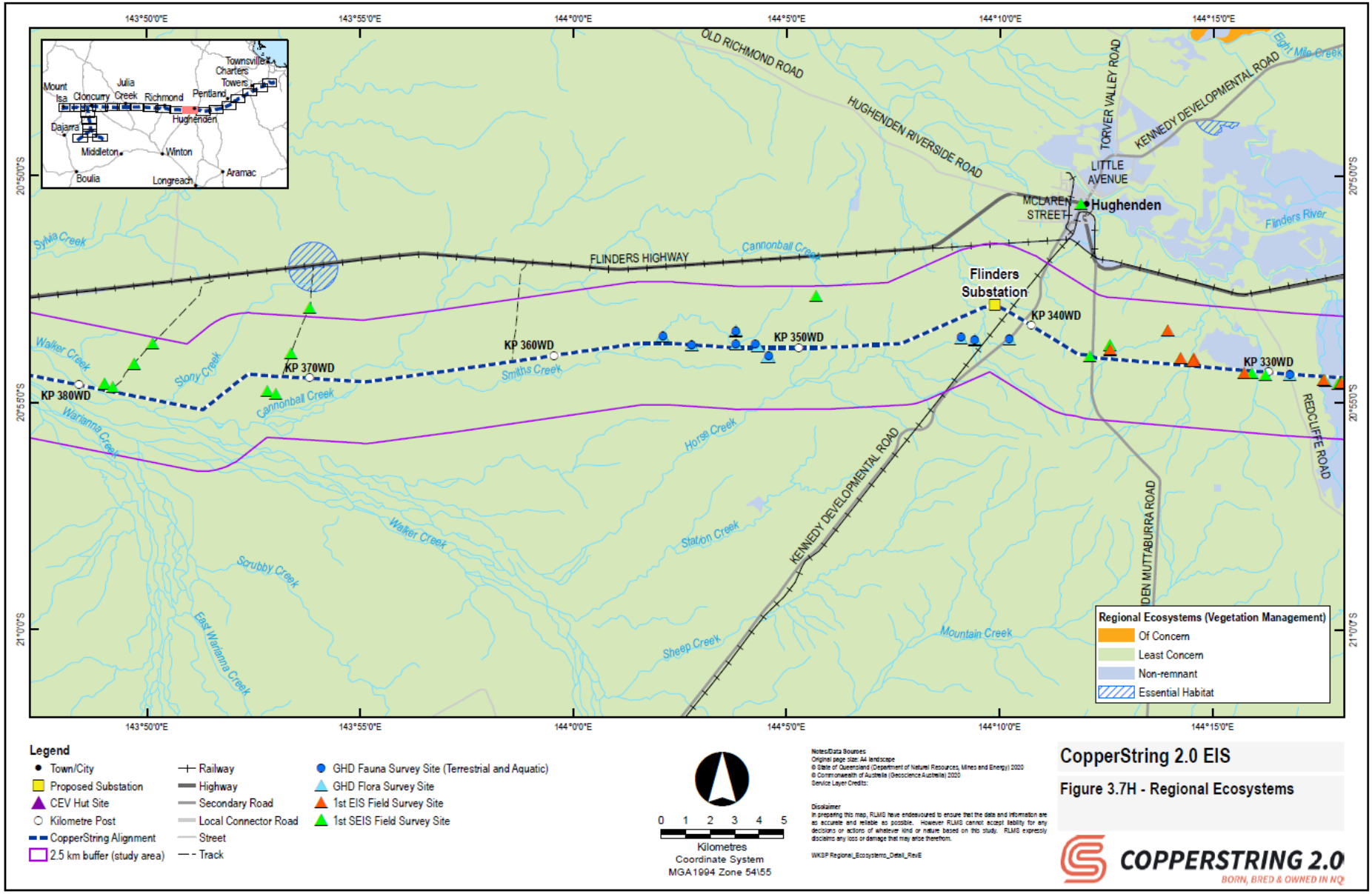
WKSP Regional_Ecosystems_Detail_RevE
CopperString 2.0 EIS
Figure 3.7G - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ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Townsville
Charters Towers
Mount Isa
Cloncurry
Julia Creek
Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
OLD RICHMOND ROAD
HUGHENDEN RIVERSIDE ROAD
TORVER VALLEY ROAD
KENNEDY DEVELOPMENTAL ROAD
Eight Mile Creek
LITTLE AVENUE
MCLAREN STREET
Hughenden
Flinders River
Sylvia Creek
FLINDERS HIGHWAY
Cannonball Creek
Flinders Substation
KP 340WD
KP 330WD
KP 350WD
KP 360WD
KP 370WD
KP 380WD
Walker Creek
Stony Creek
Smiths Creek
Warianna Creek
Horse Creek
REDCLIFFE ROAD
Station Creek
Scrubby Creek
East Warianna Creek
Sheep Creek
Mountain Creek
DEN MUTTABURRA ROAD
Regional Ecosystems (Vegetation Management)
Of Concern
Least Concern
Non-remnant
Essential Habitat
Legend
Town/City
Proposed Substation
CEV Hut Site
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Secondary Road
Local Connector Road
Street
Track
GHD Fauna Survey Site (Terrestrial and Aquatic)
GHD Flora Survey Site
1st EIS Field Survey Site
1st SEIS Field Survey Site
0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55
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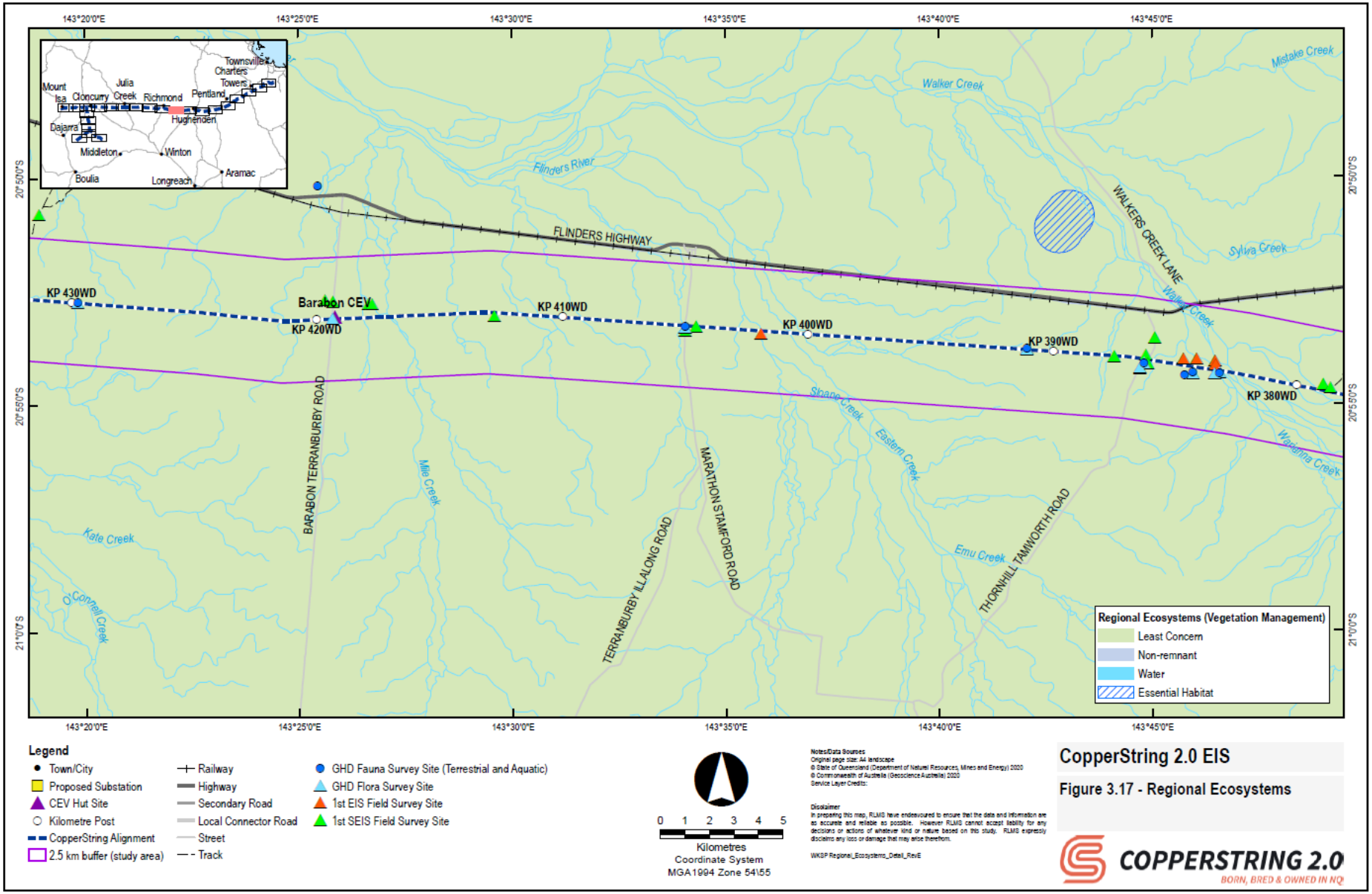
WKSP Regional_Ecosystems_Detail_RevE
CopperString 2.0 EIS
Figure 3.7H - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ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Charters Towers
Mount Isa
Cloncurry
Julia Creek
Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
Flinders River
Walker Creek
Mistake Creek
Sylvia Creek
FLINDERS HIGHWAY
WALKERS CREEK LANE
KP 430WD
KP 420WD
Barabon CEV
KP 410WD
KP 400WD
KP 390WD
KP 380WD
BARABON TERRANBURBY ROAD
Mile Creek
Shapo Creek
Eastern Creek
Wacanna Creek
MARATHON STAMFORD ROAD
TERRANBURBY ILLALONG ROAD
THORNHILL TAMWORTH ROAD
Emu Creek
Kate Creek
O'Connel Creek
Regional Ecosystems (Vegetation Management)
Least Concern
Non-remnant
Water
Essential Habitat
Legend
Town/City
Proposed Substation
CEV Hut Site
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Secondary Road
Local Connector Road
Street
Track
GHD Fauna Survey Site (Terrestrial and Aquatic)
GHD Flora Survey Site
1st EIS Field Survey Site
1st SEIS Field Survey Site
0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55
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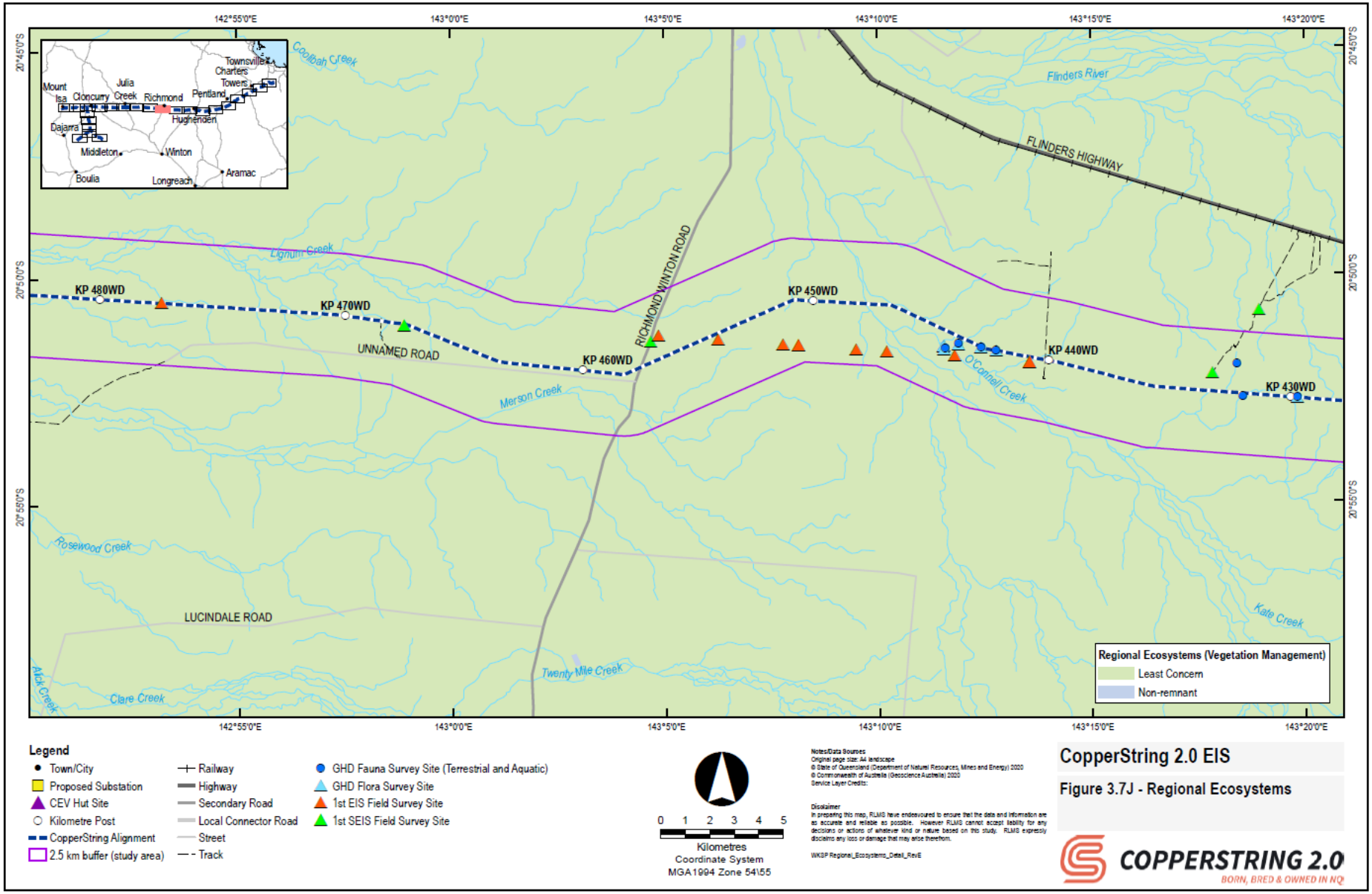
Figure 3.17 - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ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Charters Towers
Mount Isa
Cloncurry
Julia Creek
Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
Coolibah Creek
Flinders River
FLINDERS HIGHWAY
Lignum Creek
KP 480WD
KP 470WD
KP 460WD
KP 450WD
KP 440WD
KP 430WD
RICHMOND WINTON ROAD
UNNAMED ROAD
Merson Creek
O'Connell Creek
Rosewood Creek
LUCINDALE ROAD
Twenty Mile Creek
Kate Creek
Clare Creek
Atck Creek
Regional Ecosystems (Vegetation Management)
Least Concern
Non-remnant
Legend
Town/City
Proposed Substation
CEV Hut Site
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Secondary Road
Local Connector Road
Street
Track
GHD Fauna Survey Site (Terrestrial and Aquatic)
GHD Flora Survey Site
1st EIS Field Survey Site
1st SEIS Field Survey Site
0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55
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WKSP Regional_Ecosystems_Detail_RevE
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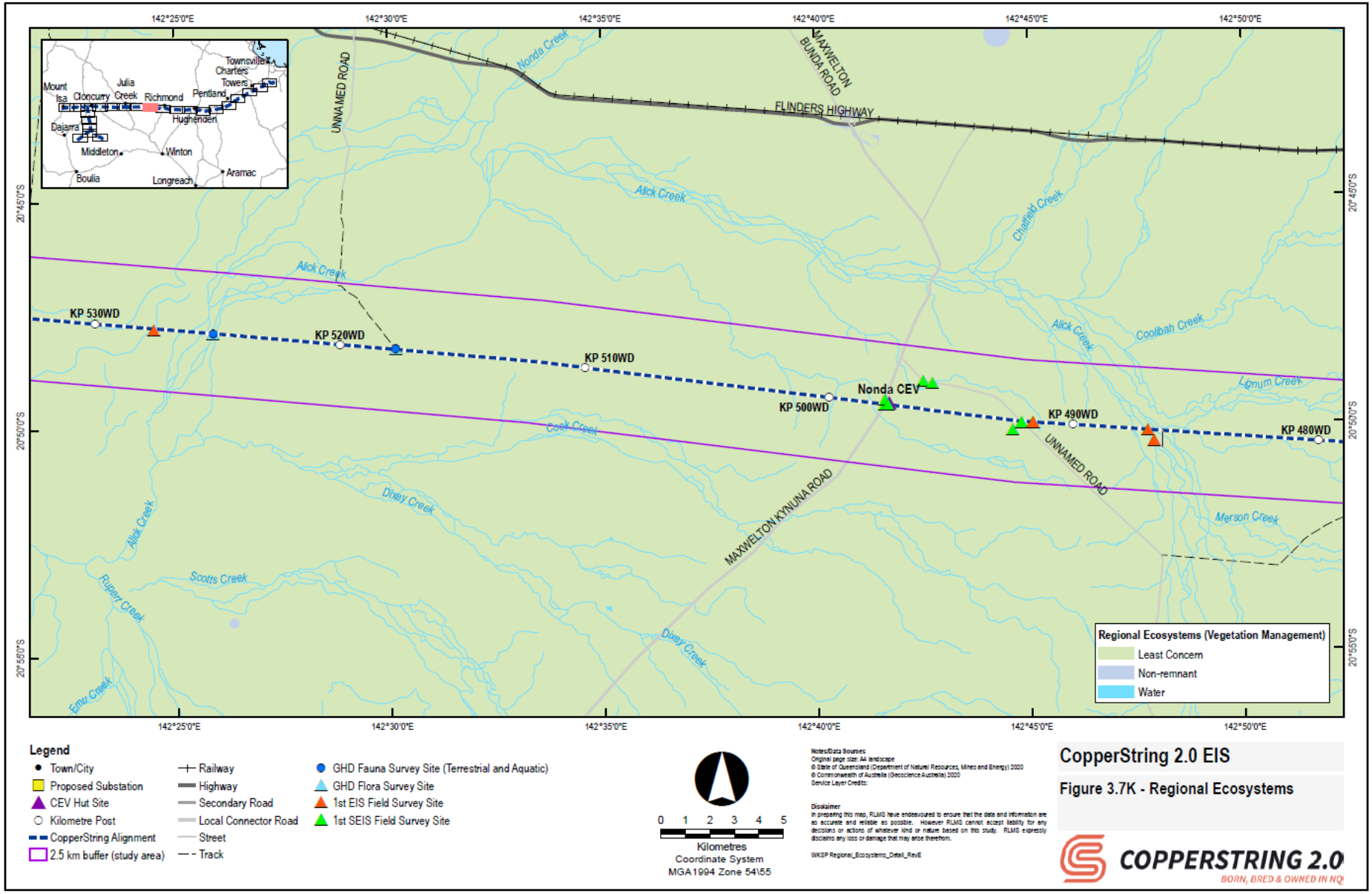
Figure 3.7J - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ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Charters Towers
Mount Isa
Cloncurry
Julia Creek
Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
UNNAMED ROAD
Nonda Creek
MAXWELTON BUNDA ROAD
FLINDERS HIGHWAY
Alick Creek
Chatfield Creek
Coolibah Creek
Lignum Creek
KP 530WD
KP 520WD
KP 510WD
KP 500WD
Nonda CEV
KP 490WD
KP 480WD
Cook Creek
Dixey Creek
MAXWELTON KYNUNA ROAD
Merson Creek
Scotts Creek
Rupert Creek
Emu Creek
Regional Ecosystems (Vegetation Management)
Least Concern
Non-remnant
Water
Legend
Town/City
Proposed Substation
CEV Hut Site
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Secondary Road
Local Connector Road
Street
Track
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GHD Flora Survey Site
1st EIS Field Survey Site
1st SEIS Field Survey Site
0 1 2 3 4 5
Kilometres
Coordinate System
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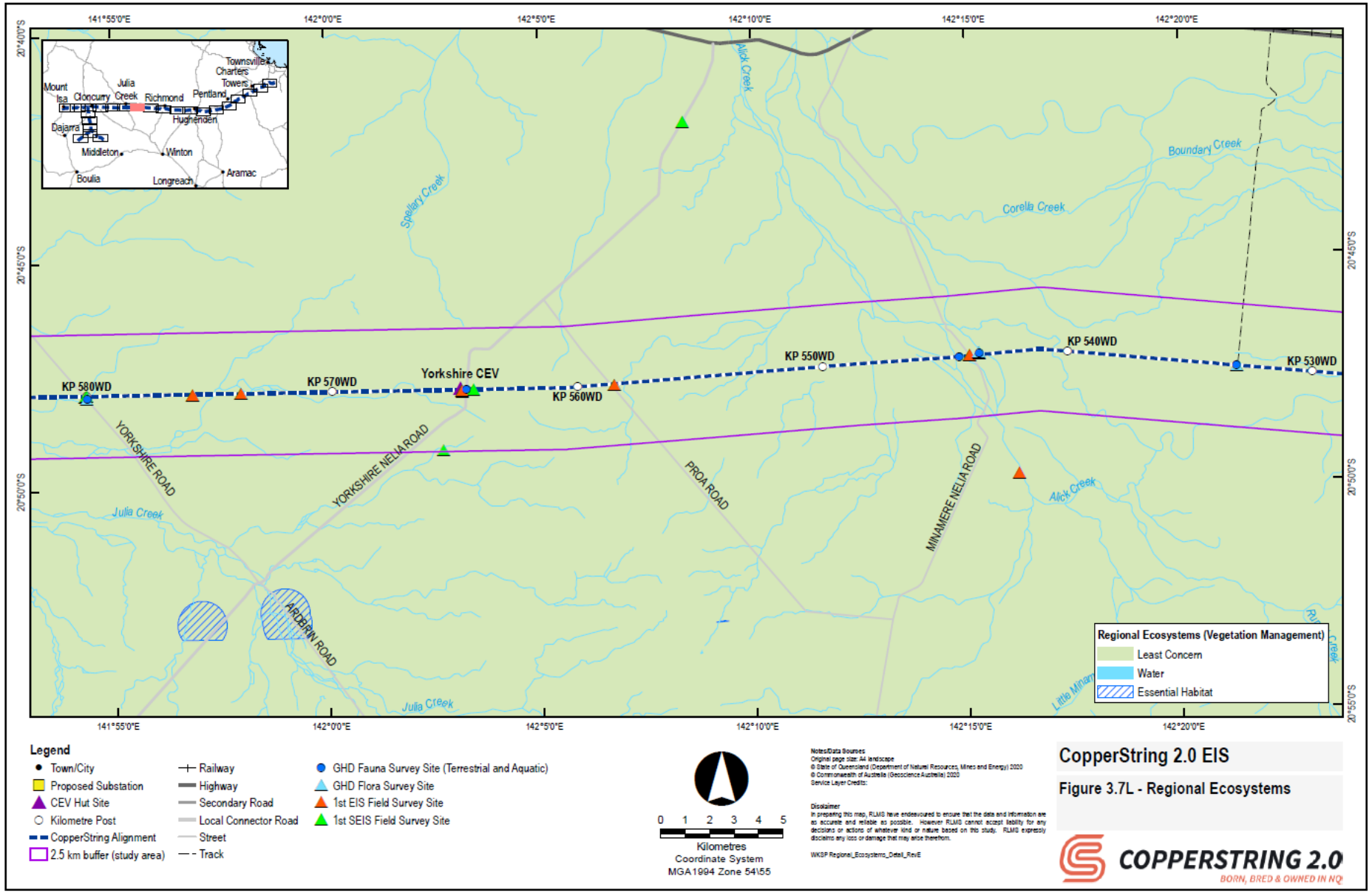
Figure 3.7K - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ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Charters Towers
Mount Isa
Cloncurry
Julia Creek
Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
Alick Creek
Boundary Creek
Spellary Creek
Corella Creek
KP 580WD
KP 570WD
Yorkshire CEV
KP 560WD
KP 550WD
KP 540WD
KP 530WD
YORKSHIRE ROAD
YORKSHIRE NELIA ROAD
PROA ROAD
MINAMERE NELIA ROAD
ARUBRN ROAD
Julia Creek
Regional Ecosystems (Vegetation Management)
Least Concern
Water
Essential Habitat
Legend
Town/City
Proposed Substation
CEV Hut Site
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Secondary Road
Local Connector Road
Street
Track
GHD Fauna Survey Site (Terrestrial and Aquatic)
GHD Flora Survey Site
1st EIS Field Survey Site
1st SEIS Field Survey Site
0 1 2 3 4 5
Kilometres
Coordinate System
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WKSP Regional_Ecosystems_Detail_RevE
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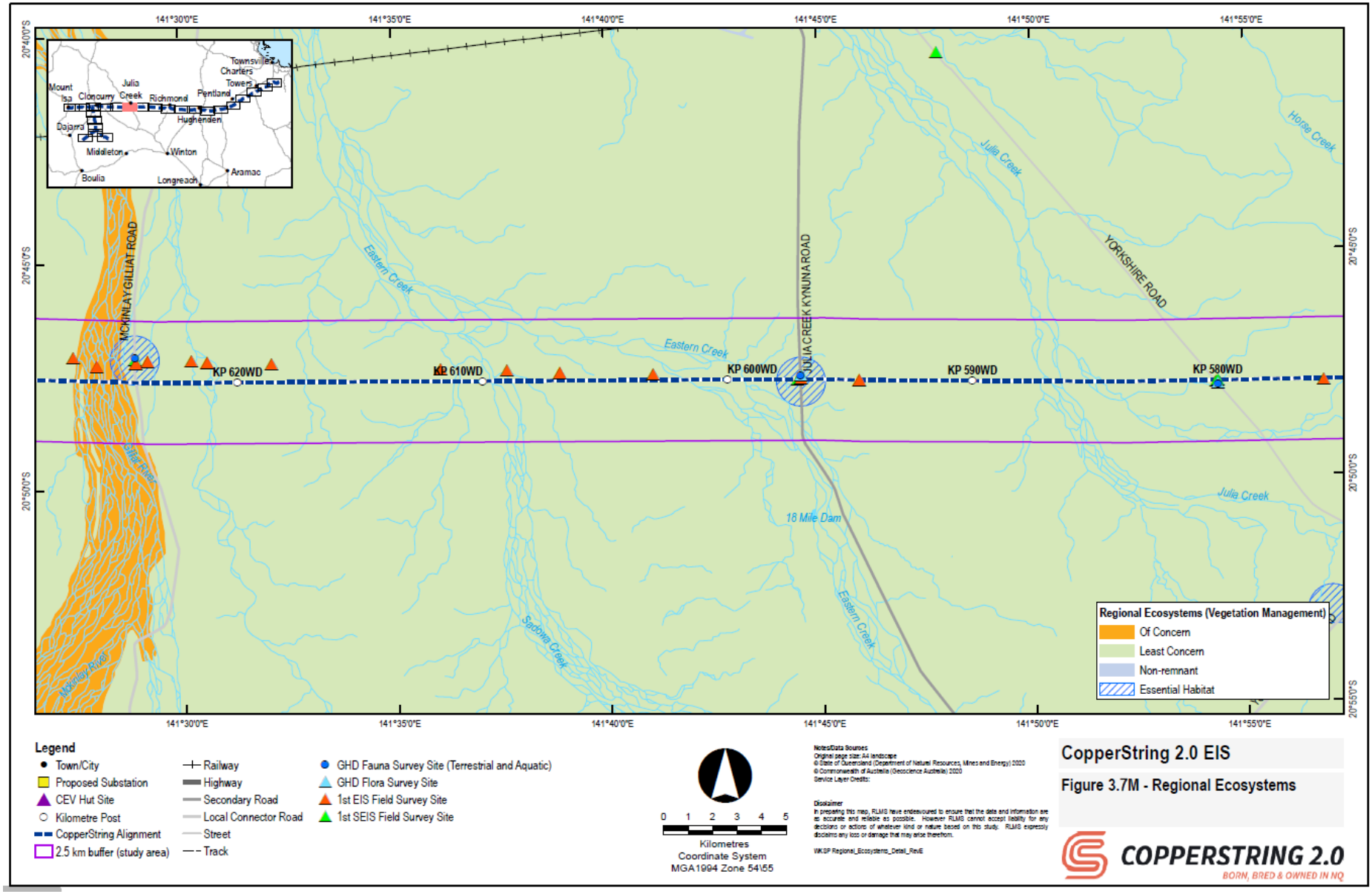
Figure 3.7L - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ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Charters Towers
Mount Isa
Cloncurry
Julia Creek
Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
MCKINLAY GILLIAT ROAD
JULIA CREEK KYNUNA ROAD
YORKSHIRE ROAD
Eastern Creek
Julia Creek
Horse Creek
Gilliat River
Mckinlay River
Sadowa Creek
18 Mile Dam
KP 620WD
KP 610WD
KP 600WD
KP 590WD
KP 580WD
Regional Ecosystems (Vegetation Management)
Of Concern
Least Concern
Non-remnant
Essential Habitat
Legend
Town/City
Proposed Substation
CEV Hut Site
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Secondary Road
Local Connector Road
Street
Track
GHD Fauna Survey Site (Terrestrial and Aquatic)
GHD Flora Survey Site
1st EIS Field Survey Site
1st SEIS Field Survey Site
0 1 2 3 4 5
Kilometres
Coordinate System
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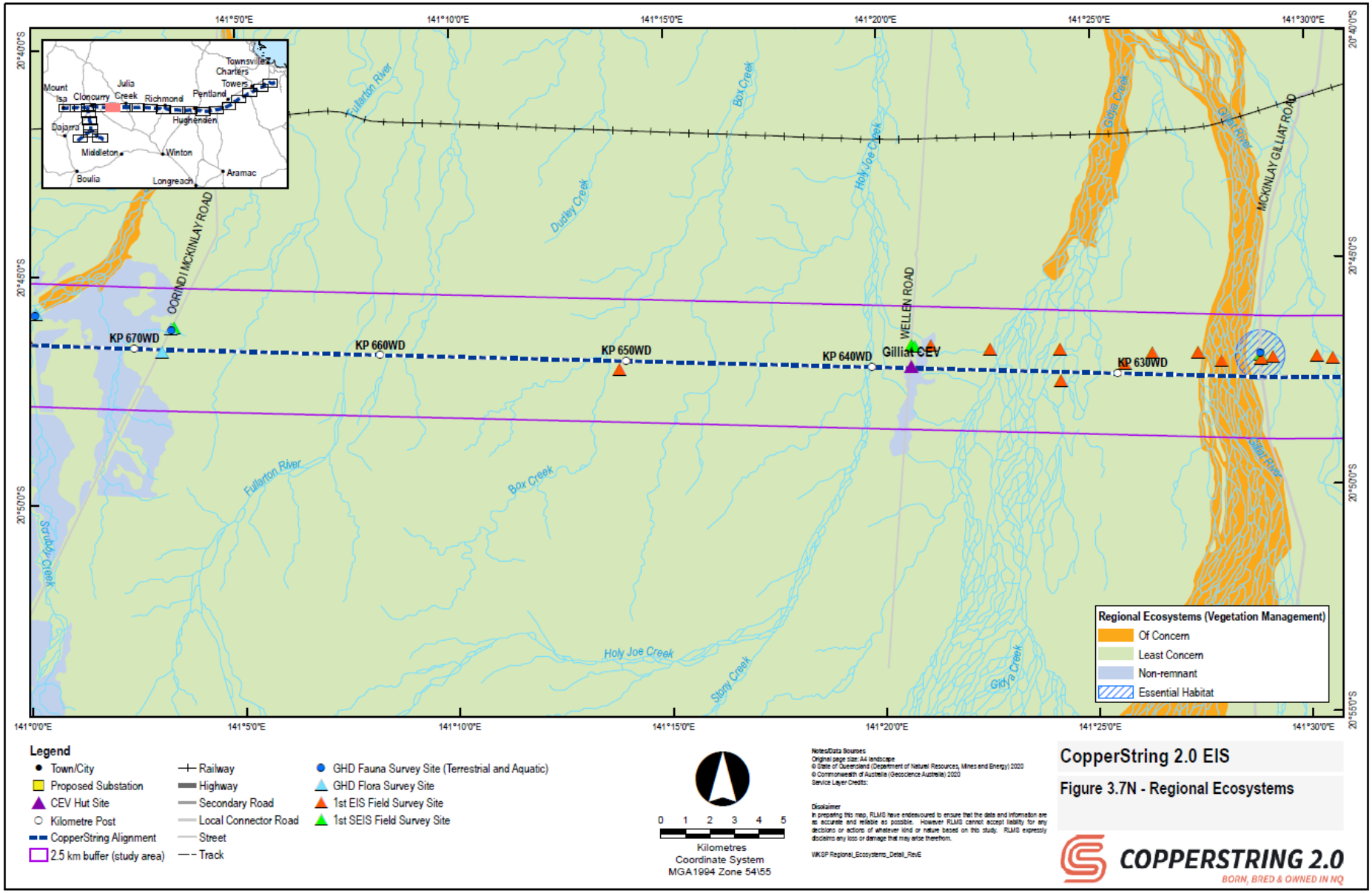
CopperString 2.0 EIS
Figure 3.7M - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ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Charters Towers
Mount Isa
Cloncurry
Julia Creek
Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
Fullarton River
Box Creek
Dudley Creek
Holy Joe Creek
Gidya Creek
Gilbert River
MCKINLAY GILLIAT ROAD
OORINDI MCKINLAY ROAD
WELLEN ROAD
KP 670WD
KP 660WD
KP 650WD
KP 640WD
Gilliat CEV
KP 630WD
Scrubby Creek
Stony Creek
Regional Ecosystems (Vegetation Management)
Of Concern
Least Concern
Non-remnant
Essential Habitat
Legend
Town/City
Proposed Substation
CEV Hut Site
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Secondary Road
Local Connector Road
Street
Track
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GHD Flora Survey Site
1st EIS Field Survey Site
1st SEIS Field Survey Site
0 1 2 3 4 5
Kilometres
Coordinate System
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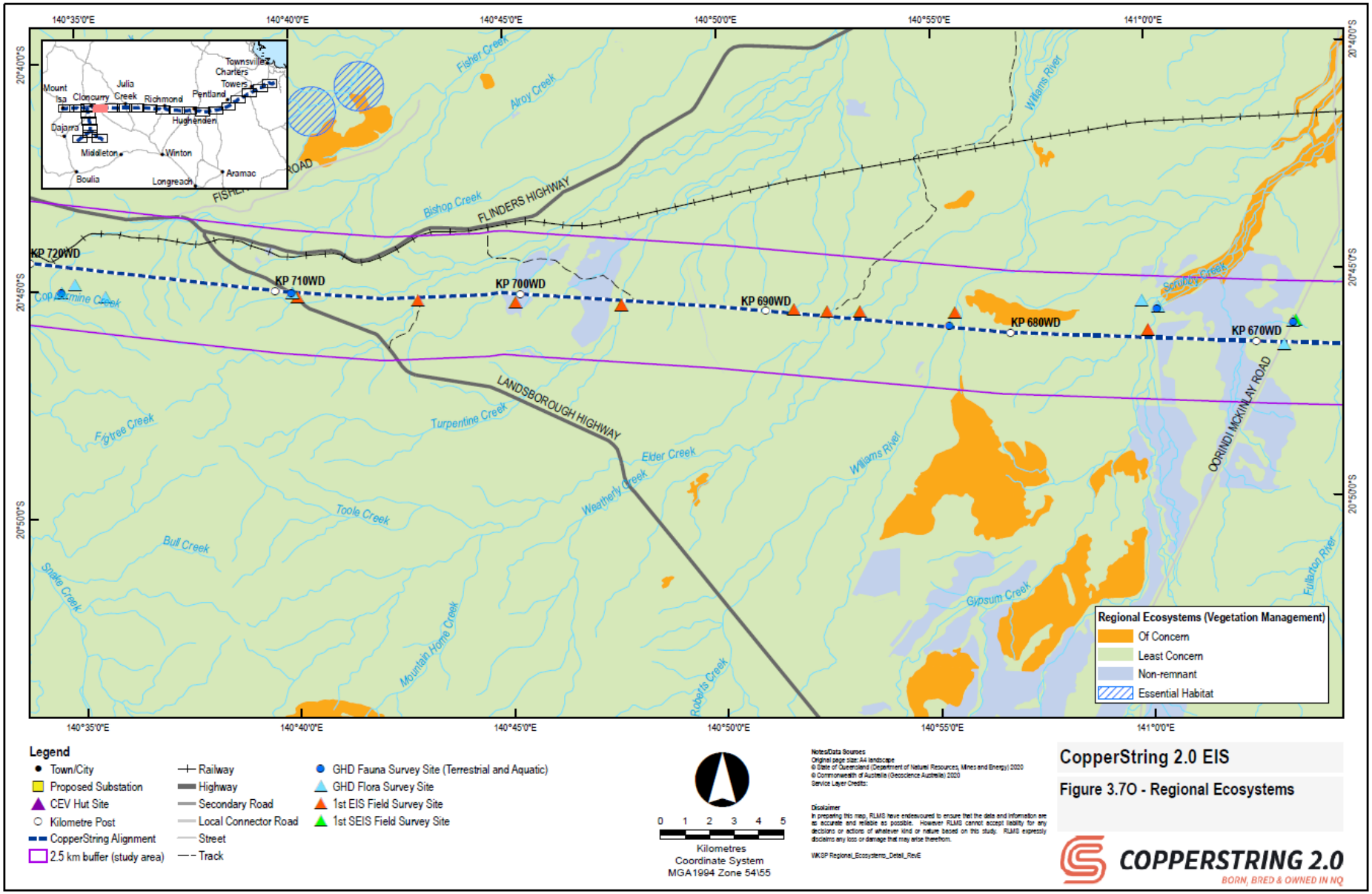
Figure 3.7N - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ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Charters Towers
Mount Isa
Cloncurry
Julia Creek
Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
Fisher Creek
Alroy Creek
Williams River
Bishop Creek
FLINDERS HIGHWAY
KP 720WD
KP 710WD
KP 700WD
KP 690WD
KP 680WD
KP 670WD
Coppermine Creek
Scrubby Creek
LANDSBOROUGH HIGHWAY
QORINDI MCKINLAY ROAD
Figree Creek
Turpentine Creek
Elder Creek
Weatherly Creek
Toole Creek
Bull Creek
Snake Creek
Mountain Home Creek
Roberts Creek
Gypsum Creek
Fullarton River
Regional Ecosystems (Vegetation Management)
Of Concern
Least Concern
Non-remnant
Essential Habitat
Legend
Town/City
Proposed Substation
CEV Hut Site
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
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Street
Track
GHD Fauna Survey Site (Terrestrial and Aquatic)
GHD Flora Survey Site
1st EIS Field Survey Site
1st SEIS Field Survey Site
0 1 2 3 4 5
Kilometres
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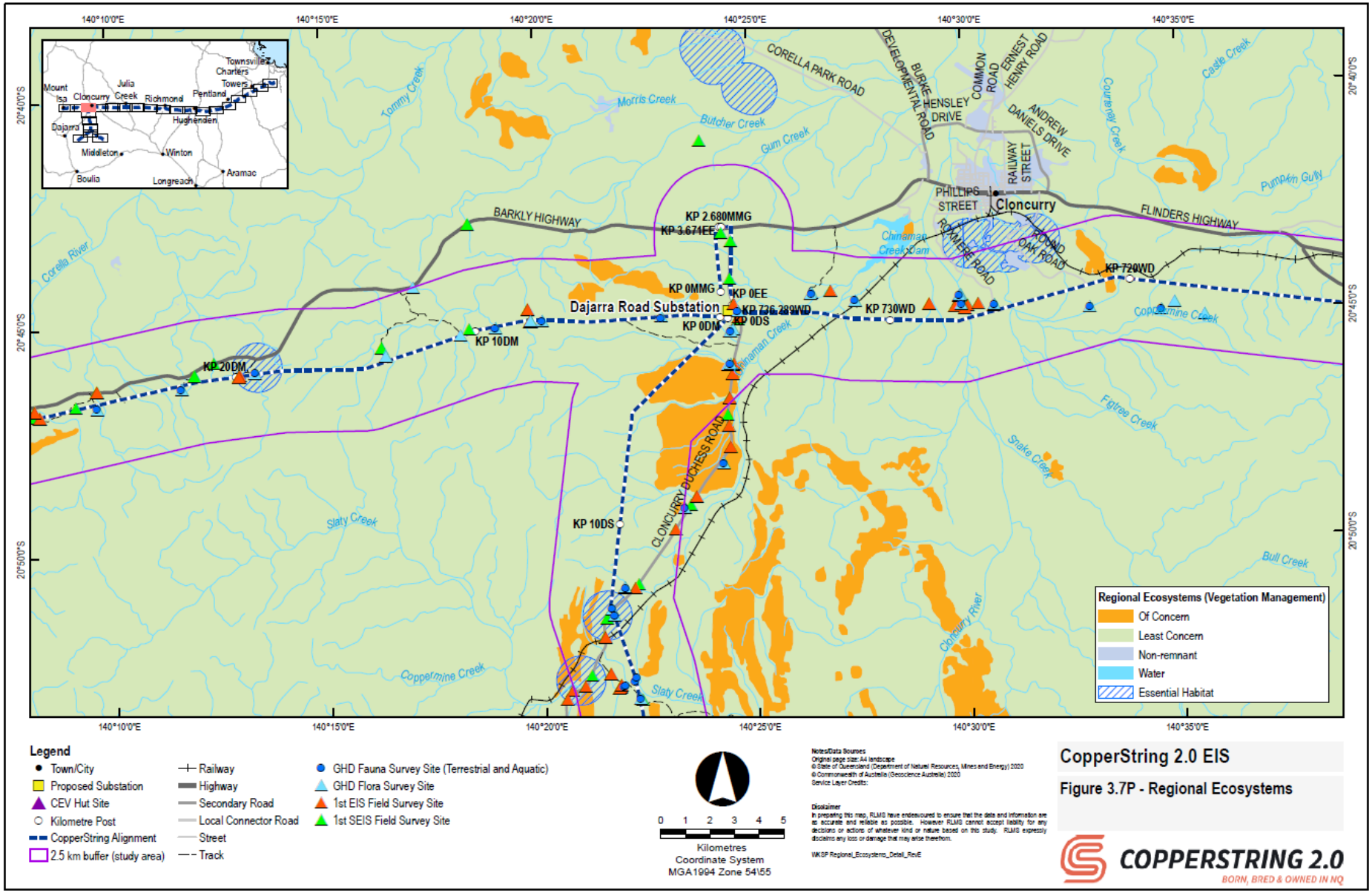
Figure 3.7O - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ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KP 730WD
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KP 10DS
BARKLY HIGHWAY
FLINDERS HIGHWAY
CORELLA PARK ROAD
DEVELOPMENTAL ROAD
BURKE HENSLEY DRIVE
COMMON ROAD
ERNEST HENRY ROAD
ANDREW DANIELS DRIVE
RAILWAY STREET
PHILLIPS STREET
ROXMERE ROAD
ROUND OAK ROAD
CLONCURRY-DUCHESS ROAD
Chinaman Creek Dam
Chinaman Creek
Morris Creek
Butcher Creek
Gum Creek
Tommy Creek
Corella River
Slaty Creek
Coppermine Creek
Figtree Creek
Snake Creek
Bull Creek
Cloncurry River
Castle Creek
Courtney Creek
Pumpkin Gully
Townsville
Charters Towers
Mount Isa
Cloncurry
Julia Creek
Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
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Regional Ecosystems (Vegetation Management)
Of Concern
Least Concern
Non-remnant
Water
Essential Habitat
Legend
Town/City
Proposed Substation
CEV Hut Site
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Secondary Road
Local Connector Road
Street
Track
GHD Fauna Survey Site (Terrestrial and Aquatic)
GHD Flora Survey Site
1st EIS Field Survey Site
1st SEIS Field Survey Site
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Kilometres
Coordinate System
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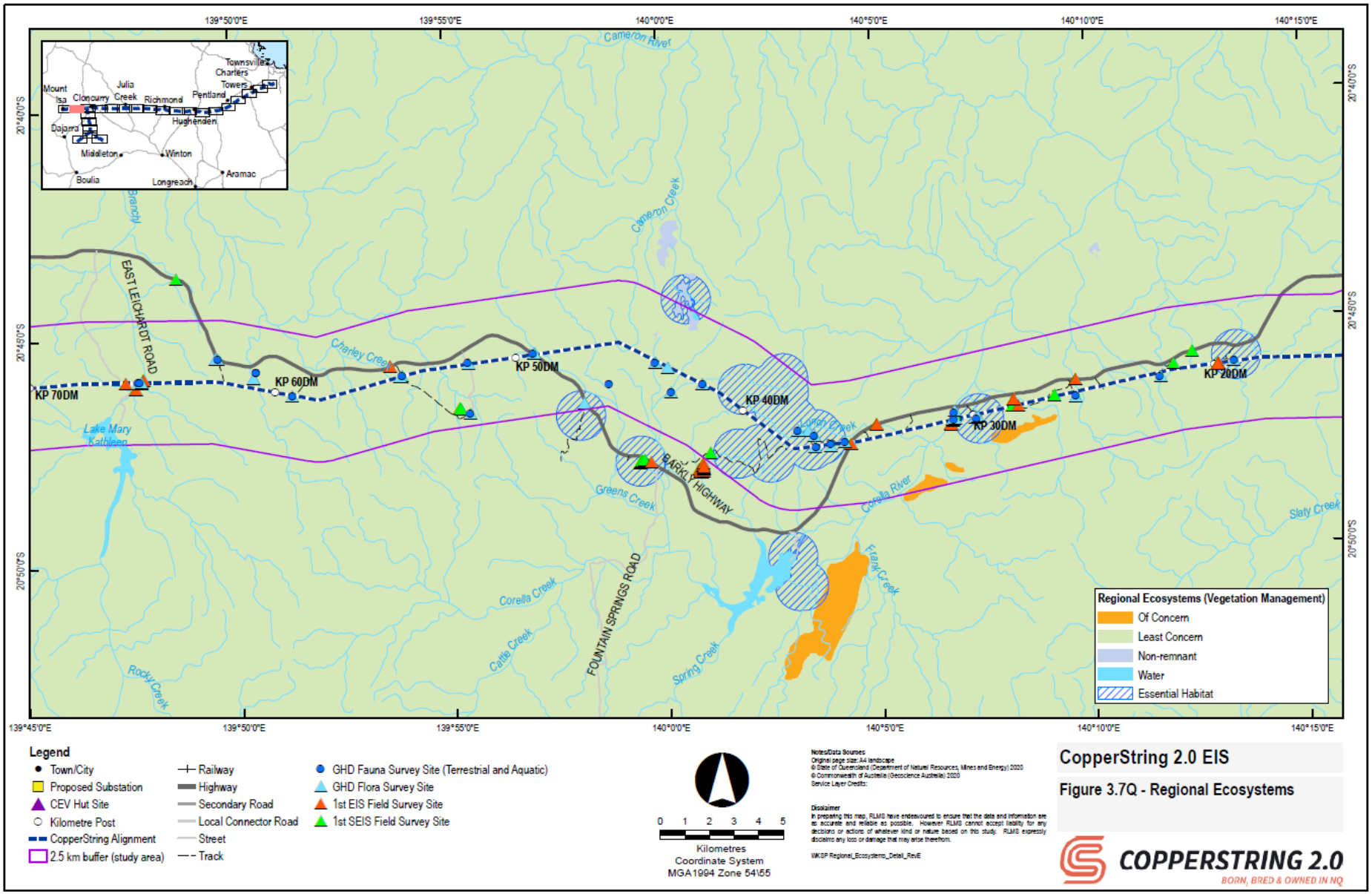
CopperString 2.0 EIS
Figure 3.7P - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ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Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
Cameron River
Cameron Creek
EAST LEICHARDT ROAD
Charley Creek
KP 70DM
KP 60DM
KP 50DM
KP 40DM
KP 30DM
KP 20DM
Lake Mary Kathleen
BARKLY HIGHWAY
Greens Creek
Corella River
Slaty Creek
Frank Creek
FOUNTAIN SPRINGS ROAD
Corella Creek
Cattle Creek
Spring Creek
Rocky Creek
Regional Ecosystems (Vegetation Management)
Of Concern
Least Concern
Non-remnant
Water
Essential Habitat
Legend
Town/City
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Coordinate System
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Notes/Data Sources
Original page size: A4 landscape
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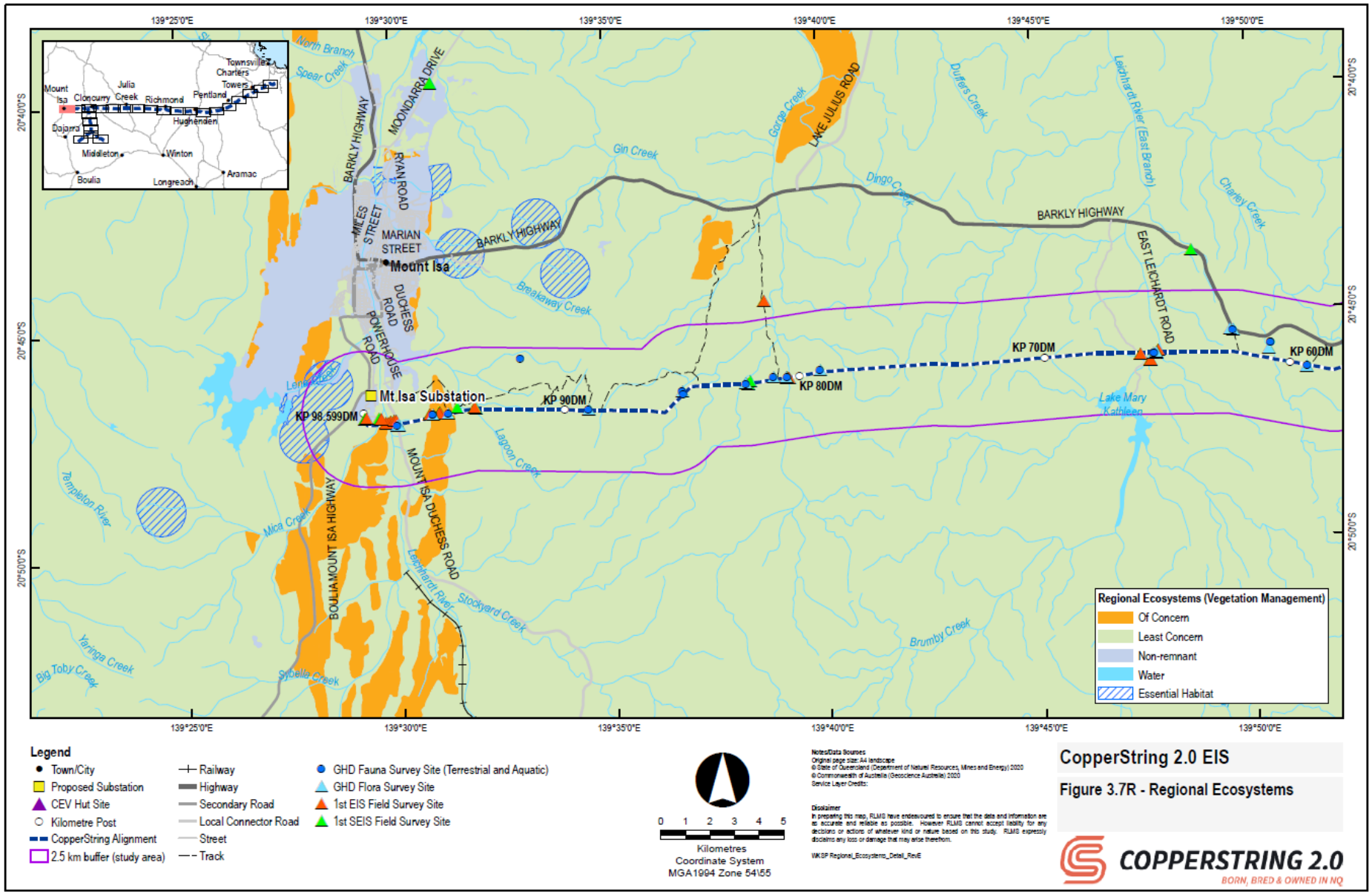
CopperString 2.0 EIS
Figure 3.7Q - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ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Townsville
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Richmond
Pentland
Hughenden
Dajarra
Middleton
Winton
Boulia
Longreach
Aramac
North Branch
Spear Creek
MOONDARRA DRIVE
BARKLY HIGHWAY
RYAN ROAD
MILES STREET
MARIAN STREET
Mount Isa
DUCHESS ROAD
POWERHOUSE ROAD
Gin Creek
Gorge Creek
LAKE JULIUS ROAD
Duffers Creek
Leichhardt River (East Branch)
Dingo Creek
Charley Creek
EAST LEICHHARDT ROAD
Breakaway Creek
Lane Creek
Mt Isa Substation
KP 98.599DM
KP 90DM
KP 80DM
KP 70DM
KP 60DM
Lake Mary Kathleen
Lagoon Creek
MOUNT ISA DUCHESS ROAD
BOULIA MOUNT ISA HIGHWAY
Templeton River
Mica Creek
Leichhardt River
Stockyard Creek
Brumby Creek
Yaringa Creek
Big Toby Creek
Sybella Creek
Regional Ecosystems (Vegetation Management)
Of Concern
Least Concern
Non-remnant
Water
Essential Habitat
Legend
Town/City
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WKSP Regional_Ecosystems_Detail_RevE
CopperString 2.0 EIS
Figure 3.7R - Regional Ecosystems
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ

Appendix B Species Management Program Register

Type of Species Management Program	Applicable location	Applicable species	Status
High-risk	Hughenden workforce accommodation camp	Short-beaked echidna (*Tachyglossus aculeatus*) Rainbow bee-eater (*Merops ornatus*) Red-browed pardalote (*Pardalotus rubricatus*) Striated pardalote (*Pardalotus striatus*)	Approved by DESI on 10/06/2024

Appendix C Fauna Handling and Rescue Procedure

Purpose

This procedure explains the actions to be taken if an animal or eggs are discovered on the Project site that require handling or rescue during vegetation and soil clearance and ongoing construction activities. The procedure relates primarily to injured shocked and juvenile individuals but also applies to nocturnal fauna or slow moving species that may not be capable of moving away from mobile plant and equipment.

Scope

This procedure is applicable to all native and introduced species that are found on the Project site.

Induction / Training

All project personnel will attend the Project induction, which will include a section on Fauna and the requirement that only personnel with a Damage Mitigation Permit are to interfere with wildlife.

Procedure

In the event wildlife (including shocked, juvenile animals or eggs) are discovered on the Project site during vegetation and soil clearance and ongoing construction activities the following steps shall be taken:

1. **STOP ALL WORK** in the vicinity of the fauna and immediately notify a Superintendent, who is then to notify an Environmental Advisor or the Project Environmental Representative
2. Contact project ecologist to obtain positive identification of the subject species
3. Preferably allow fauna to leave the area without intervention.
4. If immediately available, use a licensed suitably qualified fauna spotter catcher to carry out any fauna handling.
5. To minimise stress to native fauna and remove the risk of further injury the suitably qualified fauna spotter catcher shall:
    a. Attempt to herd animal into an adjoining vegetated area outside the project boundary
    b. If capture is necessary cover larger animals with a towel or blanket and place in a large cardboard box and/or cotton/calico bag
    c. Place smaller animals in a cotton/calico bag tied at the top
    d. Keep the animal in a quiet, warm, ventilated and dark place away from noisy construction activities.
    e. Aquatic fauna are to be placed in plastic aquaria or a moistened plastic bag.

    Note 1. Some animals require particular training before being handled (e.g. venomous reptiles, raptors) and should only be handled by appropriately qualified and experienced personnel i.e. fauna spotter catch with relevant Damage Mitigation Permit

    Note 2. If handling bats, the handler must be vaccinated against the Australian Bat Lyssavirus (ABL - a form of rabies).

6. If the animal cannot be handled (i.e. venomous reptiles):
   a. Exclude all personnel from the vicinity with fencing and / or signage
   b. Record the exact location of the individual and provide details to the appropriate rescue agency.
7. If the animal is injured call the fauna spotter catcher immediately and follow any advice provided. The fauna spotter catch may nominate to contact a rescue agency (e.g. WIRES) to assist. Any decisions regarding the care of the animal will be made by the fauna spotter catcher, with advice from the rescue agency as required.

   In the event the rescue service and/or local veterinary service cannot be contacted, the injured animal will be delivered to the relevant agency as soon as practically possible. The injured animal should be recorded on the Fauna rescue and relocation register.
8. If the fauna species is a threatened species that is not identified in the EIS the Project Environmental Representative must:
   a. Apply the Unexpected Finds Procedure (refer to Appendix D)
   b. Immediately cease all work likely to affect the threatened species
   c. The Project Environmental Representative shall contact Powerlink Queensland to inform them of the situation.
   d. Powerlink Queensland shall then contact the following stakeholders, in this order, to determine the appropriate corrective actions and additional safeguards to be undertaken:
      i. Department of Climate Change, Energy, the Environment and Water
      ii. Department of Environment and Science.
   e. Project Environmental Representative to record find as an incidence in accordance with Section 9 of the CEMP.
   f. Following consultation with all relevant stakeholders, the Project Environmental Representative shall implement any corrective actions and additional safeguards.
   g. Following confirmation by the Project Environmental Representative that all appropriate safeguards have been implemented, construction works shall recommence.
9. Relocation of fauna adjacent to the footprint will be undertaken by, or under advice from, the fauna spotter catcher and will be recorded on the Fauna rescue and relocation register. If the animal is not injured or stressed, it may be released nearby in an area that is not to be disturbed by construction, in accordance with the following procedures:
   a. Sites identified as suitable release points by the fauna spotter catcher
   b. Release will be into similar habitat as close to the original area as possible
   c. If the species is nocturnal, release will be carried out at dusk
   d. Release would generally not be undertaken during periods of heavy rainfall
   e. Hollow-dependent species, particularly those with dependent young, shall be released into a temporary nest box.

Appendix D Unexpected Threatened Species Procedure

Introduction

Purpose

This Unexpected Threatened Species Procedure details the actions to be taken when a threatened flora or fauna species or threatened ecological community is unexpectedly encountered during construction of the project.

Scope

This Procedure is applicable to all activities conducted by site personnel that have the potential to come into contact with threatened flora and fauna species and threatened ecological communities during construction of the project.

Where threatened fauna is unexpectedly encountered, the Fauna Handling and Rescue Procedure (refer to Appendix C) will be followed.

Procedure

Overview

An overview of the steps to be followed in the event that a threatened flora or fauna species or threatened ecological community is unexpectedly discovered on site is outlined in Figure 3, with further detail provided below.



Figure 3 Unexpected threatened species procedure

Appendix E EWMS Clearing and Grubbing

ENVIRONMENTAL WORK METHOD STATEMENT (EWMS)

EWMS Title:	Clearing and Grubbing	**EWMS No:**	N01037-EN-EWM-00001	**Revision No:**	A

Work **must** be performed in accordance with this EWMS. The EWMS **must** be available for inspection where the task is being performed, at all times during the task. If the EWMS is revised, all versions should be kept.

Organisation Details:	CuString 2032	**Supervisor on Project:**	
Project Manager	Matt Lennon	**Date:**	
Work Activity:	Clearing and Grubbing	**Work Location:**	Project Wide
Who will ensure compliance:	David McLean (Environmental Manager) 0457 757 435	**How compliance be measured**	Environmental Inspections, EWMS audits
How will the control measures be reviewed?	Environmental Inspections, EWMS Audits, Permit to disturb	**Who will review control measures**	David McLean (Environmental Manager)

What are the tasks involved? List the work tasks in a logical order.	**What are the hazards and risks?** Identify the hazards and risks that may cause harm to the environment	**What are the control measures?** Describe what will be done to control the risk. What will you do to make the activity as environmentally safe as possible?	**Responsibility** *(Who will direct works to ensure compliance?)*
PLANNING OF WORKS			
▪ Planning of Works	▪ Works commencing without approval	▪ At least ten working days prior to the proposed commencement of clearing commences, Approved Project Boundary and clearing limits must be detailed and verified as correct by a surveyor. This may be in the form of on ground delineation or GPS control on plant and equipment for the clearing operation. ▪ Where Project Boundary is within the clearing limit consultation with PC will be sought. ▪ Before clearing can commence a Pre-Clearing and Permit to Clear must be completed and signed by all relevant personnel. A Site Environmental Plan (SEP) showing the extent of clearing relevant to that checklist must be included in the work pack and referenced to the Clearing Permit. ▪ Confirm that the works are within the approved locations in accordance with the Sensitive Area Plans and the design. ▪ Sensitive area plans will include details of sensitive areas, area to be disturbed, identified weed infestations and any required controls specific to the area (e.g. as identified under the Species Management Program where applicable).	Environmental Site Representative (ESR) /Engineer/ Supervisor
▪ Ensure weed and soil debris is removed from plant and equipment prior to arrival on site	▪ Spread of weeds, pathogens or mud	▪ Upon arrival to site, all plant / machinery / vehicles will be inspected along with the completed JV Plant and Machinery Clean-down Declaration Certificate ▪ All plant / machinery / vehicles will be inspected to ensure no weeds material, mud or dirt (that may contain pathogens), dirt are present otherwise entry will be refused ▪ Machinery working within known weed and pathogen locations will be required to be cleaned prior to moving to other locations around the project corridor. ▪ Controls required under the Land access agreements must be implemented for the properties impacted in accordance with those agreements	Plant Manager
▪ Develop Erosion and Sediment Control Plans (ESCP)	▪ Impacts on waterways ▪ Impacts on receiving environment	▪ ESCP to be developed and reviewed by Project Soil Conservationist at least 10 days prior to commencement of clearing operations.	ESR/ Engineer / Supervisor
▪ Provide training to all personnel and subcontractors involved	▪ Non-compliance with work methods	▪ Toolbox Project Engineer and Superintendent / Foreman on the requirements of this EWMS and any other requirements relevant to the work activity, all procedures relevant to the work activity and work location and ESCP's relevant to the work activity. ▪ All personnel must be toolboxed on the primary content contained within this EWMS and sign on to the section below.	All personnel

PRE CLEARING ACTIVITIES			
▪ Identify project boundaries, clearing limits and “No-Go” Areas	▪ Unauthorised clearing of native vegetation damage to items of significance	▪ Have surveyors mark the limit of clearing (LoC) and the approved project boundary at least ten working days prior to commencement of clearing ▪ Prior to commencing clearing a forecast area of clearing for each of the vegetation communities listed in G40 must be undertaken ▪ GIS survey strings must be prepared for each Disturbance footprint detailed in the design related to the works for the project. ▪ Ensure limit of clearing been clearly marked in accordance with the approved Delineation Approach or GIS control, ensuring each marker can be seen from the next, as per Permit to Clear Land or Vegetation. ▪ All pegs delineating complex boundaries shall be numbered (or flagged) to avoid confusion when erecting flagging ▪ Approved Project Boundary must be as per the CU String delineation Protocol (under development), (**example only**) detailed below o Green Pegging – Project Boundary o Orange Pegging – Clearing Limits/Exclusion Fencing o Red/White Tape – Habitat Tree “H” Spray Painting o Yellow/Black Tape - 10m exclusion zone from underground services o Blue/White Pegs – Clearing Limits Stage 1 Work (non Habitat) o Orange Parawebbing - “NO ENTRY- Environmental Protection Area” signs – (key Heritage, Threatened Flora/Fauna). Absolutely NO ENTRY WITHOUT WRITTEN PERMIT FROM ESR ▪ The limit of clearing to be pegged with highly visible, pegs made of robust and durable material. ▪ Pegging to remain in place until completion of that work area (i.e. civils works, excluding tower construction) to prevent accidental clearing. ▪ No-Go areas including heritage sites and areas of threatened flora and fauna to be fenced and “NO ENTRY- Environmental Protection Area” signs – (Heritage, Threatened Flora/Fauna). Absolutely NO ENTRY WITHOUT WRITTEN PERMIT FROM ES (Note only where applicable).	Survey Team/Construction Manager/Engineer
▪ Pre-clearing ecological survey	▪ Inadvertently impacting unidentified EEC, threatened species or habitat	Pre clearing inspections will be undertaken by a suitably qualified and licensed ecologist and arborist immediately prior to clearing in accordance. ▪ Initial pre-clearing survey tasks will include, but not be limited to delivery of a clearing and grubbing plan / report containing: ▪ Verifying the location of the ‘protected area’ fencing (flagging tape) ▪ Searches for mark-up, mapping and estimates of any threatened flora, EEC for retention ▪ Assess trees, stumps and logs to be removed outside of the area to be cleared for the formation for the purpose of habitat reuse.	ESR/Ecologist

		▪ Searches for, marking and GPS recording significant habitat features such as hollow-bearing trees, birds and other significant fauna features (e.g. significant logs) ▪ Identification and marking/mapping of noxious or significant environmental weeds infestations in accordance with Biosecurity Management Plan. ▪ Immediately prior to clearing an inspection will confirm that the sites subject to pre-clearance surveys remain free of fauna. The fauna spotter will undertake fauna rescue and relocation as required, and establish temporary construction buffers as required. ▪ At the commencement of clearing activities, a post-clearing report must be completed providing a summary of the results of surveys, fauna rescues, fauna injury and mortality (if applicable).	
▪ Identification of weed areas	▪ Spreading of weeds	▪ Areas of weed infestations are to be marked on the SEP. ▪ The areas of weed infestations will be flagged on site and these areas will be isolated to minimise the spread of weeds into non-weed infested areas. Weed suppression will be undertaken as per the Biosecurity Management Plan. ▪ Vehicle movements are to be controlled moving between these areas ▪ Vehicle Movement Plans (VMPs) will be developed to ensure that vehicles wherever possible move from uninfested weed areas towards infested weed areas ▪ Vehicles, plant and machinery are to be free of weed containing matter when arriving on site and moving between weed infested and non-weed infested areas ▪ Truck wash down (where necessary) and rumble grids to be installed and operated to ensure mud, weeds or pathogens are not transported around the region or onto roads ▪ Ensure wheels, bodies and undercarriage of vehicles are free from loose material before travelling on public roads	ESR/Ecologist Engineer/ Operators Weed Contractor
▪ Pre-clearing inspection	▪ Unauthorised damage to items of significance	▪ Permit to Clear is to be completed by the ESR and given to the Engineer before any clearing to be undertaken ▪ Machine operators and supervisors to all be involved in morning inspection of the days clearing boundaries and work areas to ensure limits are clear to all involved ▪ The use of a daily work area tape as per the approved delineation approach is to be rolled out around that days proposed limits, during the pre-clear inspection	
▪ Implement environmental controls	▪ Soils, sediments and water impacts	▪ Implement environmental controls prior to disturbance to: ○ prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain outlets ○ reduce water velocity and capture sediment on site ○ minimise the amount of material transported from site to surrounding pavement surfaces ○ divert clean water around the site (where practicable) in accordance with the IECA- White Book	

		▪ ESC controls will be installed prior to commencing works. Where this is not possible, ESC controls are to be installed concurrently with the works and at a minimum on the same day that ground disturbance occurs that is likely to generate sediment ▪ Where sediment basins are necessary, all sediment basins and associated drainage to be installed and commissioned prior to the commencement of clearing or grubbing within the catchment area of the sediment basin that may cause sediment to leave the site. Staged clearing may be required prior, in order to construct catch drains and sediment basins in heavily vegetated areas ▪ All weeds identified in the preclearance survey must be treated and disposed of in accordance with the Biosecurity Management Plan.
▪ Spray weeds with herbicide (where necessary)	▪ Non-compliance	▪ Herbicide and/or pesticide application is to be administered by authorised personnel only.
	▪ Incorrect weed treatment	▪ Treat areas of noxious weed infestation in accordance with the herbicide specific to each species, as provided in the Biosecurity Management Plan. ▪ Areas sprayed with herbicide will remain undisturbed for a period as is recommended by the herbicides manufacturer
	▪ Overspray	▪ The weed contractor is to ensure that weather conditions are such that spray drift will not arise due to 'windy' conditions ▪ Application Record Sheet, or content similar to, shall be used to track spraying.
	▪ Efficient usage of chemical	▪ Spraying of noxious weeds will be carried out in accordance with the following to avoid damage to adjacent native vegetation and to prevent overspray entering waterways or adjacent property. ▪ Pesticides will be used in accordance with relevant legislation, label directions and any relevant industry codes of practice. ▪ Pesticides Application Records will be maintained. ▪ Pesticides Application Records Sheet will not be required to be completed when: o The pesticide is only applied by hand or by using hand-held equipment o If applied outdoors on any single occasion in quantities of no more than 5 litres/5 kilograms of concentrated product or 20 litres/20 kilograms of the ready-to-use product, or; if applied indoors in quantities of no more than 1 litre/1 kilogram of concentrated product or 5 litres/5 kilograms of the ready-to-use product o all personnel managing and using pesticides will be appropriately trained prior to commencing work o only pesticides registered for use near water will be used near water.
	▪ Improper community consultation	o Notify the landholder of access to site and implementation of biosecurity measures. ▪ Pre-emergent herbicides may be used to prevent the growth of weeds ▪ Where deemed required by the weed contractor or Project Ecologist.

	▪ Poor spraying outcomes	▪ Do not use spray herbicide in proximity to threatened flora species, as the spray can drift onto the threatened species. In this case, undertake cut-stump or stem injection methods of weed control ▪ Do not use herbicide that will detrimentally affect water quality, or spray herbicide so close to a watercourse that the herbicide can enter the water and contaminate the waterway. Only pesticides registered for use near water may be used near water	
COMMENCEMENT OF CLEARING & GRUBBING			
▪ Undertake clearing and grubbing operations	▪ Inadvertently impacting heritage areas, EEC, threatened species and hollow bearing trees	▪ Workers are to be familiar with the location of 'protected areas'; all heritage areas, outside the clearing limits, threatened species and hollow bearing trees as per the SEP. ▪ Note – Identified threatened flora species are to be relocated prior to commencing works. If a threatened species / EEC is unexpectedly encountered during clearing activities, STOP ALL WORK and immediately notify the ESR or Project Manager who will notify PQ. Refer Unexpected finds procedure. ▪ If in doubt, DO NOT CLEAR and seek further clarification from the ESR.	All personnel
	▪ Injury to fauna	Implement two-stage clearing approach as outlined in the Flora and Fauna Management Plan; ▪ Ecologist to undertake pre-clear inspection immediately prior to clearing of vegetation ▪ Non habitat trees are to be cleared first ▪ Wait a minimum of 48 hours (two nights) to allow fauna to leave the habitat trees ▪ Under the guidance of the Project Ecologist the habitat trees are to be felled with the rotating harvester head. ▪ Felled habitat trees to be inspected by the fauna Spotter. Should the Fauna Spotter consider there is potential that fauna area still occupying hollows of felled trees, the hollows may be cut or if there is a risk of injury to fauna, the logs can be left and rechecked the following day or placed on the edge of adjoining habitat. Ecologist is to salvage and relocate fauna. ▪ Clearing contractor shall provide assistance to the fauna Spotter while inspecting the habitat trees for fauna ▪ Remove fauna prior to felling where possible using appropriate trapping methods as specified by the Ecologist in accordance with the Fauna Handling and Rescue Procedure ▪ Post-Clearing Inspection Checklist to be completed by fauna spotter following clearing ▪ Where timber has been left on the ground overnight this shall be checked again by spotter catcher/ecologist prior to movement and mulching	Ecologist/Clearing Contractor/ESR/Supervisor /Engineer

		▪ Fauna Spotter to keep GPS records of all survey activities, fauna captured, release sites and mortality ▪ All light vehicles must stay on designated tracks ▪ Should any injured fauna be found on the site, local wildlife care groups and/or local veterinarians are to be contacted immediately and arrangements made for the welfare of the animal.	
	▪ Impacts to Koalas	▪ Where koalas are identified during clearing all works shall cease for a minimum period of 48 hours within the clearing area to allow the animal to move out of the construction site on its own volition ▪ The direction of sequential clearing will be away from threatening processes or hostile environments, i.e. roads. The ecologist is responsible for verifying that sequential clearing has taken place. ▪ An ecologist/ spotter catcher is to supervise all clearing of Koala habitat.	ESR/Ecologist/Engineer
	▪ Flora impacts	▪ If a threatened flora species / EEC is unexpectedly encountered during clearing activities, STOP ALL WORK in the vicinity of the find and immediately notify the ESR or Project Manager. Refer to the Unexpected Finds Procedure ▪ Vegetation cleared from the construction footprint is to be either mulched and stockpiled for later reuse as an erosion and sediment control measure or for fauna habitat. Mulch and topsoil shall not be stockpiled in no-go areas and cleared vegetation shall not be pushed into no-go areas. Use of mulch will be avoided in areas where it may pose a risk to water quality (e.g. flood prone land, along drainage lines, etc.) ▪ Prior to clearing, ensure that where possible, seeds of local native vegetation including trees, shrubs, grasses and herbs have been collected for reuse in revegetation and landscaping treatments ▪ Under supervision of the ESR, logs can be placed outside the LoC to provide fauna habitat. Salvage and set aside where possible hollow and large logs, stumps, bushrock and any other suitable habitat material that are on site and able to be utilised in rehabilitation areas later on. ▪ Weed spraying to be carried out with care to avoid damage to adjacent native vegetation and to prevent overspray entering waterways or adjoining properties ▪ Implement weed and pathogen protocols for vehicles entering and leaving site. The protocols will include: o cleaning down vehicles, plant and footwear prior to being introduced to the site o cleaning down vehicles, plant and footwear that have been in contact with topsoils / leaf litter / groundcovers before exiting site ▪ Ensure no materials are stockpiled, no vehicles are parked under the canopy and no haul roads under the canopy drip line. ▪ Avoid excavation or the placing of fill near any tree without advice from the Arborist/ ecologist.	Superintendent / ESR / Project Manager / Arborist

	▪ Damage of heritage items, particularly Scar Trees	▪ If a suspected heritage item is found, stop any work within 50m of the item and contact the ESR immediately. Refer to Unexpected Heritage Find Procedure.	All personnel
	▪ Air quality impacts	▪ Undertake works in a manner that minimises dust emissions ▪ Minimise traffic generated dust by adhering to and enforcing construction speed limits ▪ Water sprays, sprinklers and water carts may be employed to adequately dampen stockpiles, work areas and exposed soils to prevent the of dust from the site ▪ Loading of trucks from low height ▪ Ensure trucks are free of loose material and loads are covered prior to exiting work site onto public roadways ▪ Works are not to be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely.	Supervisor/ESR
	▪ Soils, sediments and water impacts	▪ ESC controls will be installed prior to commencing works. Where this is not possible, ESC controls are to be installed concurrently with the works and at a minimum on the same day that ground disturbance occurs that is likely to generate sediment ▪ Erosion and sediment control measures are not to be removed until the works are complete and disturbed areas are stabilised ▪ Erosion and sediment controls are to be checked and maintained on a weekly basis, pre, during and after each rainfall event ▪ Weather and radar information shall be checked daily for storm and rain events by the ESR and work shall be scheduled to avoid these events. ▪ All required works will maximize use of existing cleared areas to minimize clearing and reduce the incidence of erosion ▪ Identify Acid Sulfate Soil risk areas prior to commencement and ensure controls are in place for in situ testing and treatment where required and identified. Stockpiles are to be located in approved Acid Sulfate Soil Treatment Area locations outside of drainage lines. ▪ Provide protection that prevents vegetative material from falling into or entering any creek or stream ▪ Disturbed areas are to be rehabilitated as soon as practicable ▪ Should unexpected, contaminated land be encountered, the relevant works will stop and the potentially contaminated area of land will be identified and further investigation undertaken, PQ will be notified of the contamination. Commencement of works will be on approval from PQ. ▪ Stockpiles are to be bunded with diversion bund >300mm (functional height), have clean water diverted around them. ▪ Limit mulch stockpiles to less than 2m high.	ESR/Soil Conservationist/Supervisor/ Engineer

		▪ Existing trees, grasses and other ground cover must be retained within 15 meters of watercourses and in all drainage lines until immediately before construction onles otherwise required. ▪ The cut-stump method must be applied to vegetation within 15m of watercourses ▪ Limit clearing within 15m of watercourses, rivers and creeks until immediately before construction commences in the area.	
	▪ Landscape and visual impacts	▪ Soil disturbance and clearing of vegetation, will be minimised to the fullest extent possible ▪ Upon completion of the works, any works areas will be restored to an acceptable visual state in consultation with any affected land owner. As a minimum, the site will be seeded or utilise soil seed bank and areas rehabilitated to existing conditions.	Engineer / Supervisor
	▪ Disturbance to receivers due to noise and vibration	▪ All reasonable and feasible noise mitigation measures to be implemented with the aim of achieving the construction noise objective ▪ Where possible, avoid the coincidence of noisy plant working simultaneously close together and adjacent to sensitive receivers ▪ Where possible, orient the plant known to emit noise strongly in one direction so that the noise is directed away from noise sensitive areas ▪ Ensure plant items are well maintained and fitted with silencers, where practical ▪ Care to be taken not to drop materials and waste from a height, either into or out of trucks ▪ Site access points and vehicle movements to be routed as far from sensitive receivers as practical ▪ Where machines are fitted with engine covers, these are kept closed whenever the machine is in use ▪ Plant operators to switch off plant whenever the equipment is not going to be used for more than 15 minutes ▪ Truck routes to and from worksites are to be via major roads where possible in accordance with the Vehicle Movement Plan. Trucks not to queue up outside residential properties ▪ Trucks not to use engine brakes on site near sensitive recivers. Limit compression breaking as far as practicable ▪ All out of hours works proposed must be in accordance with the Out of Hours Works Protocol (to be developed) in CNVMP ▪ Reversing of vehicles and equipment, and use of horns to be minimised ▪ Construction noise and vibration management levels shall comply with the requirements of the approvals. ▪ During night works personnel shall avoid yelling, excessive use of UHF radio, the use of horns etc.	ESR/Supervisor

	▪ Hazardous substances, spills and improper handling	▪ If dangerous substances are stored on site: o bunds are to be covered and be able to contain 120 percent of the largest container stored within it o a chemical register will be maintained. Keep SDS up to date for all chemicals. SDS kept onsite and in Safety Folders o general purpose spill kits will be provided at the fuel and chemical storage areas these are to be kept free of rubbish and adequately stocked with spill equipment at all times o conduct inspections of the hazardous substances storage areas during weekly inspections. Document any findings relating to chemical storage, status of bund (visible staining / spills / leaks etc.), and spill kit stock levels and availability ▪ All fuels, chemicals and liquids are to be stored in an impervious bunded area (at least 120 percent capacity of stored volume) a minimum of 50 metres away from: o rivers, creeks or any areas of concentrated water flow o flood prone or poorly drained areas o slopes above 10 percent. ▪ Where practicable, lockable storage shall be considered for fuels and chemicals to avoid acts of vandalism and wilful harm ▪ Refuelling of plant and equipment is to occur with the use of spill traps and be located a minimum of 50 metres from drainage lines or waterways. ▪ Vehicle wash down is to occur in a designated bunded area. Excess debris will be removed prior to transporting plant / equipment to the wash down areas ▪ An emergency spill kit is to be kept on site at all times. All staff are to be made aware of the location of the spill kit and trained in its use ▪ An emergency procedure for chemical spills, hydrocarbon spills and other potential incidents shall be developed prior to works commencing to be ready if required during construction ▪ The DES must be notified immediately through PQ in response to incidents causing or threatening actual or potential harm to the environment.	Supervisor/ ESR
	▪ Waste and resource management	▪ The work site shall be maintained in a clean and tidy condition and the site will be managed to minimise waste Waste shall: o not be burnt on site o be collected and sorted into waste streams and, where possible, recycled o be collected from the works areas and sites so they are waste free ▪ All excess spoil shall be removed from the site and disposed of in an environmentally sensitive manner or recycled where possible. Wastes required to be disposed off-site will be done at appropriate approved facilities in compliance with relevant legislation	Clearing Contractor/ESR/Engineer/ Supervisor

		▪ Waste generated outside the site shall not be received at the site for storage, treatment, processing, reprocessing or disposal on the site.	

Workers Consulted in the development of this EWMS				
Name	**Position**	**Company**	**Signature**	**Date**
David McLean	**Environment Manager**	**CPB**		

Additions or Alterations **Note:** All alterations must be authorised by the Environmental Site Representative *(or authorised delegate)*.	**Date of Addition or Alteration**	**ESR Review** *(or authorised delegate)*		
		Date of Review:	Date of Review:	
Update Contact details	08/01/2020		☐ Yes	☐ No
			☐ Yes	☐ No
			☐ Yes	☐ No
			☐ Yes	☐ No
			☐ Yes	☐ No
			☐ Yes	☐ No
			☐ Yes	☐ No
			☐ Yes	☐ No

Work Location		Work Pack Reference	

1	I understand the requirements of this EWMS	**3**	I understand what the hazards of the work is and what the risks are
2	I have been given an opportunity to comment on the method of work	**4**	I understand what controls must be in place before starting work

Name of Worker	Signature	Date	Name of Worker	Signature	Date

Appendix F Permit to Clear

Permit to Clear Land or Vegetation

PART A: PERMIT DETAILS: (completed by Engineer)

Project Name:				**Project No:**	
Work Location:		**Work Pack Reference No:**		**Lot No:**	
Purpose of Disturbance:					
Start Date:	/ /		**Finish Date:**	/ /	
Supervisor for Works:			**Subcontractor for Works:**		
ESCP Attached	**Yes** ☐		**Scope of Works:**		
Sensitive Area Map Attached	**Yes** ☐				
Clearing Drawings Attached:	**Yes** ☐				
Chainage of Permit	**Start:**		☐ ESCP Hold Point released for this Area		
	Finish:		☐ Clearing Hold Point Released for this Area		
	Finish Point Delineated	**Yes** ☐			
Comments:					

IMPORTANT: Once the above is complete please forward to the Environmental Manager (or delegate - Engineer) for Approval (Part C)

PART B: PRE WORKS CONTROLS: Tick as completed ✓ (completed by Supervisor/Foreman)

	Condition	Completed Y	Completed N	Date	Comments
1.	No clearing to be undertaken until this Permit to Clear Land or Vegetation is received, signed, completed and all permit conditions understood and in place	☐	☐		
2.	Disturbance area delineated with flagging tape or similar	☐	☐		
3.	Exclusion areas identified and boundaries marked and clearly visible. **Any works required within the Protected or 'No Go' Areas will require separate approval**	☐	☐		
4.	Ground engaging equipment confirmed as weed free (use Tool: Plant and Equipment Cleandown Declaration).	☐	☐		
5.	All personnel supervising the works have been shown the clearing limits by Permit Acceptor	☐	☐		
6.	Vegetation to be stockpiled separately in approved location or used for Erosion Sediment control or fauna habitat.	☐	☐		
7.	ESC have been installed if soil disturbance is to occur	☐	☐		
8.	Suitably experienced Fauna Spotter Catchers engaged for tree felling	☐	☐		
9.	Disturbance area inspected for fauna and habitat trees and relocated or marked for retention where applicable	☐	☐		
10.	Project Ecologist has surveyed the area nominated for clearing (See Part F Sign-off)	☐	☐		
11.	Extent of clearing has been marked with Blue/White tape	☐	☐		
12.		☐	☐		

PART C: PERMIT ISSUE (completed by Engineer)

I confirm the work area is controlled and surveyed and authorise work to proceed in strict accordance with the conditions (Part B) stated in this Permit and associated Work Pack and CEMP.

Engineer:		**Signature:**		**Date:**	/ /

PART D: PERMIT ACCEPTANCE (completed by Supervisor)

I confirm and accept the conditions stated in this Permit and associated work activity documents. I will ensure strict adherence to these conditions and all persons under my control will be advised accordingly.

Supervisor:		Signature:		Date:	/ /

PART E: PERMIT ACCEPTANCE (to be signed by personnel who have walked the clearing alignment)

A worker required to work under this Permit must comply with the following instructions:

1. Ensure you understand the scope of the work activity and your role / tasks.
2. Ensure you understand the requirements of the EWMS and any associated Permits. You must ask questions if you are unsure and report any concerns / issues immediately.
3. Notify the Supervisor immediately if you become aware of a new hazard or change in conditions while performing the works.
4. All operators involved with clearing have been advised of the Permit conditions and understand the requirements and clearing boundary

PRINT NAME	SIGNATURE	DATE

PART F: ECOLOGIST WALKTHROUGH (completed by Ecologist daily)

I confirm the below work area has been surveyed and authorise works to proceed in strict accordance with the conditions contained within the EWMS (Refer to Clearing Drawings)

Start Chainage:		**Finish Chainage:**		**Drawing Reference**	
Project Ecologist:		**Signature:**		**Date:**	/ /

I confirm the below work area has been surveyed and authorise works to proceed in strict accordance with the conditions contained within the EWMS (Refer to Clearing Drawings)

Start Chainage:		**Finish Chainage:**		**Drawing Reference**	
Project Ecologist:		**Signature:**		**Date:**	/ /

I confirm the below work area has been surveyed and authorise works to proceed in strict accordance with the conditions contained within the EWMS (Refer to Clearing Drawings)

Start Chainage:		**Finish Chainage:**		**Drawing Reference**	
Project Ecologist:		**Signature:**		**Date:**	/ /

I confirm the below work area has been surveyed and authorise works to proceed in strict accordance with the conditions contained within the EWMS (Refer to Clearing Drawings)

Start Chainage:		**Finish Chainage:**		**Drawing Reference**	
Project Ecologist:		**Signature:**		**Date:**	/ /

I confirm the below work area has been surveyed and authorise works to proceed in strict accordance with the conditions contained within the EWMS (Refer to Clearing Drawings)

Start Chainage:		**Finish Chainage:**		**Drawing Reference**	
Project Ecologist:		**Signature:**		**Date:**	/ /

I confirm the below work area has been surveyed and authorise works to proceed in strict accordance with the conditions contained within the EWMS (Refer to Clearing Drawings)

Start Chainage:		**Finish Chainage:**		**Drawing Reference**	
Project Ecologist:		**Signature:**		**Date:**	/ /

I confirm the below work area has been surveyed and authorise works to proceed in strict accordance with the conditions contained within the EWMS (Refer to Clearing Drawings)

Start Chainage:		**Finish Chainage:**		**Drawing Reference**	
Project Ecologist:		**Signature:**		**Date:**	/ /

I confirm the below work area has been surveyed and authorise works to proceed in strict accordance with the conditions contained within the EWMS (Refer to Clearing Drawings)

Start Chainage:		**Finish Chainage:**		**Drawing Reference**	
Project Ecologist:		**Signature:**		**Date:**	/ /

I confirm the below work area has been surveyed and authorise works to proceed in strict accordance with the conditions contained within the EWMS (Refer to Clearing Drawings)

Start Chainage:		**Finish Chainage:**		**Drawing Reference**	
Project Ecologist:		**Signature:**		**Date:**	/ /

I confirm the below work area has been surveyed and authorise works to proceed in strict accordance with the conditions contained within the EWMS (Refer to Clearing Drawings)

Start Chainage:		**Finish Chainage:**		**Drawing Reference**	
Project Ecologist:		**Signature:**		**Date:**	/ /

I confirm the below work area has been surveyed and authorise works to proceed in strict accordance with the conditions contained within the EWMS (Refer to Clearing Drawings)

Start Chainage:		**Finish Chainage:**		**Drawing Reference**	
Project Ecologist:		**Signature:**		**Date:**	/ /

PART G: PERMIT CLOSURE (completed by Supervisor)

	Condition	Completed		Date	Comments
1.	All clearing was within the vegetation clearing limits	Y ☐	N ☐		
2.	No marked trees (habitat or otherwise) to be retained were impacted by works	☐	☐		
3.	Area cleared, and location surveyed	☐	☐		
4.	Disturbed area has been stabilised in accordance with approved Erosion and Sediment Control Plan	☐	☐		

I confirm that all work for which this Permit was issued has been completed in accordance with conditions

Engineer:		**Signature:**		**Date:**	/ /

COPPERSTRING 2032

COPPERSTRING 2032 JV

AIR QUALITY MANAGEMENT PLAN

COPPERSTRING 2032

EDMS No : CSPW-EVN-PLN-900-000016
Revision : A02
Status : IFR
Date : 14/06/2024

Approvals and Reviews

Air Quality Management Plan	
Project	CopperString 2032
Client	Powerlink Queensland
Document Number	CSPW-EVN-PLN-900-000016

Revision History

Rev No.	Description of Revision	By	Checked	Approved	Date
A01	Developed for PDLA Work Contract	Rasuejah Achior / Padmaja Cuppala	David McLean	Matt Lennon	03/05/2024
A02	Updated incorporating PQ comments received on 31/05/2024	Padma Cuppala	Stephan Gabas	Matt Lennon	14/06/2024

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1. Introduction

The purpose of the CopperString 2032 project is to connect the North West Minerals Province (NWMP) of Queensland to the National Electricity Grid. This will not only allow existing loads in the Mount Isa and Cloncurry areas to be fed from the National Electricity Market (NEM), but also provide access to new mining loads and opportunity for connection of renewable generation.

1.1 Project scope

The CopperString 2032 Project is an extra high voltage transmission system intended to connect the North West Power System (NWPS) near Cloncurry and Mount Isa to the Powerlink network and NEM at Mulgrave. Figure 1 provides an overview of the Project.



Figure 1 CopperString 2032 proposed transmission lines and substations

The CopperString 2032 Project will connect the NWMP to the NEM to reduce the cost of power supply and facilitate the large-scale development of the Hughenden wind resource and solar resources within the North Queensland Clean Energy Hub (NQCEH).
The scope of work, traversing east to west, consists of the following sections:

- Mulgrave 500/275kV Substation as the CopperString 500kV connection point to the Queensland SuperGrid and 275kV line augmentation as the CopperString 275kV connection point to the NEM;
- Pentland 500kV Substation to support the North Queensland Clean Energy Hub (NQCEH) expansion and as the core for future load connections in the area;
- Flinders 500/300kV Substation (Hughenden) as the core for the NQCEH;
- Dajarra Road 330/220kV Substation (Cloncurry) as the core for distributions to larger load centres;
- The primary CopperString transmission backbone; and
- Termination via the Mount Isa augmentation 220/132kV.

The scope consists of a transmission line between the above locations carrying extra high voltage power transmission at 500kV, 330kV and 220kV respectively. Substations at the abovementioned interconnecting junctions will distribute power to the NWMP and NQCEH.

1.2 Abbreviations, acronyms & definitions

Table 1 Abbreviations, acronyms & definitions

Term	Definition
The Project	CopperString 2032 Project
UGL CPB JV	UGL, CPB Contractors Pty Limited Joint Venture
PQ	Powerlink Queensland
AQMP	Air Quality (Dust) Management Plan
CEMP	Construction Environmental Management Plan
EIS	CopperString Project Environmental Impact Statement documents
CoG Report	CopperString Project Coordinator-General's evaluation report on the environmental impact statement, September 2022
UGLMS	UGL Management Systems
DECCEEW	Department of Climate Change, Energy, the Environment and Water
DESI	Department of Environment Science and Innovation
SDPWO	*State Development and Public Works Organisation Act 1971*
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EP Act	*Environmental Protection Act 1994* (QLD)
EPP (Air) 2019	*Environmental Protection (Air) Policy 2019 (QLD)*
EMF	Environmental Management Framework
NWMP	North West Minerals Province
NWPS	North West Power Systems
NEM	National Electricity Market
NQCEH	North Queensland Clean Energy Hub
CLMP	Community Liaison Management Plan

2. Project Environmental Management Obligations

The Project involves construction and operation of approximately 1,000km of extra high voltage overhead electricity transmission line that will connect the Northwest power system to the state electricity grid. The project includes six (6) new substations, electricity transmission line and transmission towers every 500-600 meters (m). To support construction of the project, six construction camps, site offices, laydown/delivery areas, concrete batching plants, and access tracks to the corridor and along its alignment will be provided. The project also provides for improved communications, with the installation of fibre optic cables.

The Coordinator General (CoG) for the Department of State Development, Infrastructure, Local Government and Planning declared the project to be a 'coordinated project' under *the State Development and Public Works Organisation Act 1971* (SDPWO) requiring an Environmental Impact Statement (EIS) for the Project. In September 2022, the Coordinator General provided an evaluation report (CoG Report) on the submitted EIS for the project. This report includes an evaluation of Matters of National Environmental Significance (MNES) with recommended conditions for an approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth). In November 2022, a notification of approval was granted from the Department of Climate Change, Energy, the Environment and Water (DCCEEW) (Commonwealth) under the EPBC Act with conditions specific to the Project.

The CoG report also includes recommended conditions for proposed subsequent Ministerial Infrastructure Designations for consideration under the *Planning Act 2016* (Qld) by the Queensland Planning Minister.

The CoG evaluation was based on the draft and revised EISs, submissions made, public consultation on the draft EIS and advice from relevant Australian, State and Local government agencies.

To address and comply its legislative obligations, the UGLCPB JV has prepared a Regulatory Approvals Plan (refer Fig 2) which identifies the environmental approvals applicable to the Project. The project scope includes (but not limited to):

- Clearing vegetation and earthworks for a transmission line and ancillary infrastructure (e.g. off-easement access tracks and water sources) involving:
  - Disturbance to Matters of National Environmental Significance;
  - Disturbance to Matters of State Environmental Significance (MSES);
  - Interfering with protected species (flora and fauna);
  - Works within Native Title claimed areas; and
  - Land affected by Unexploded Ordnance (UXO).
- Constructing and operating accommodation hubs with facilities including:
  - Clearing regulated vegetation;
  - Accommodation units and offices, and carparking (involving building and plumbing and drainage works);
  - Mains connection (power, water and sewerage);
  - Mobile and temporary concrete batching plants;
  - Motor vehicle workshop;
  - Fuel (chemical) storage;
  - Water treatment, for provision of drinking water;
  - Wastewater (sewage) treatment; and
  - Biosecurity washdown bays.
- Taking water (surface and groundwater);
- Use of quarry material from commercial sources, although project specific borrow pits may be identified as an opportunity;
- Crossing mapped waterways and watercourses for access;
- Upgrading public roads;
- Working within and adjacent to rail corridors; and
- Disposing of contaminated soil (if found within properties listed on the Environmental Management Register (EMR)).

2.1 Relevant legislation and guidelines

Construction of the project must comply with environmental legislation and guidelines, and any additional requirements specified in approval conditions.

Specific legislative and other requirements relevant to this plan are detailed below.

2.1.1 Commonwealth legislation

- National Environment Protection Council Act 1994
- National Greenhouse and Energy Reporting Act 2007

2.1.2 State legislation

- Environmental Protection Act 1994
- Environmental Protection Regulation 2019
- Environmental Protection (Air) Policy 2019

2.1.3 Standards and guidelines

- National Environment Protection (Ambient Air Quality) Measure.

3. Management Plan Interface

This Air Quality (Dust) Management Plan (AQMP) is an overarching sub-plan, informing the Construction Environmental Management Plan (CEMP) as identified below in the Environmental Management Framework (EMF).

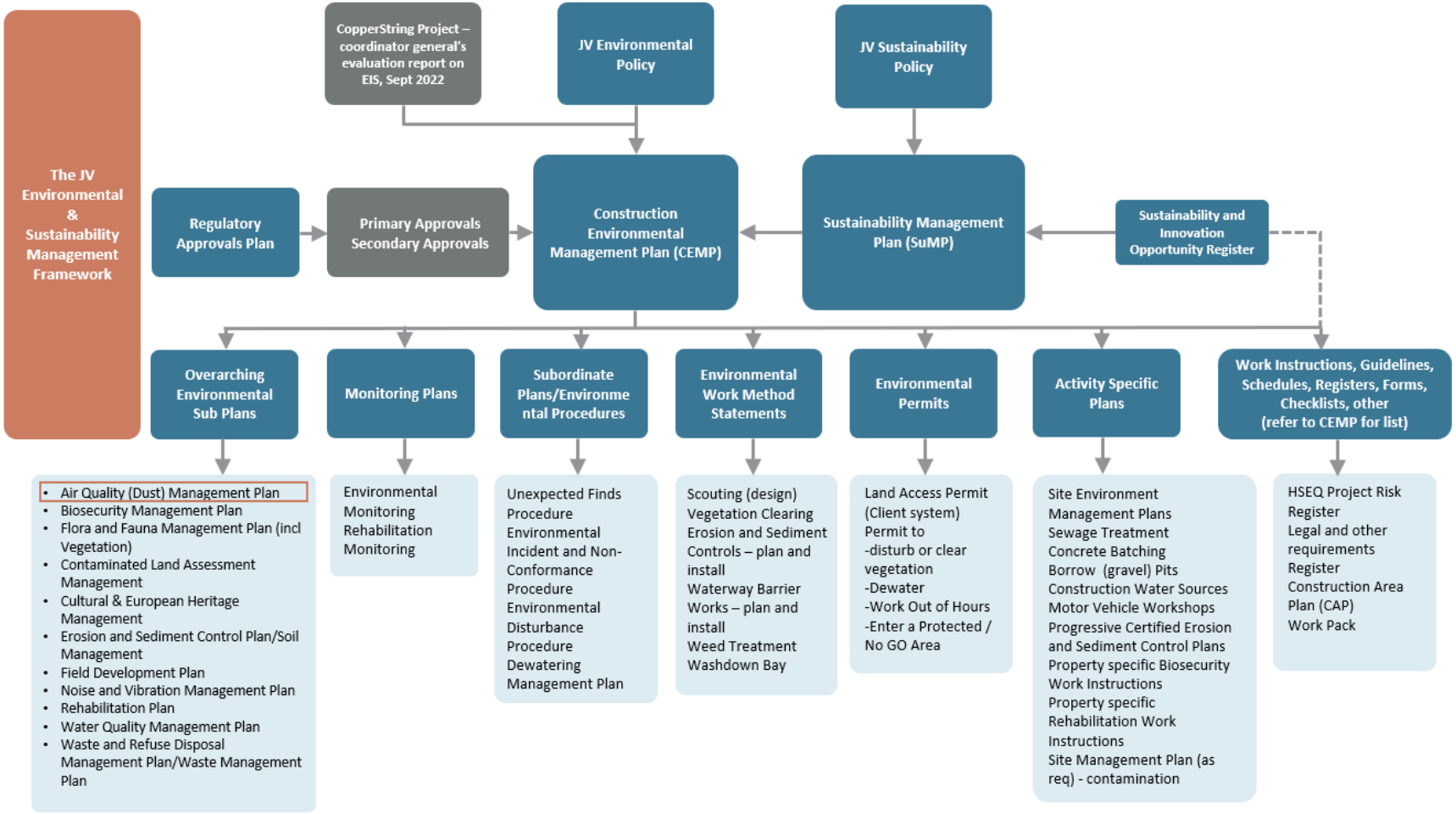

Figure 2:Environmental Management Framework – AQMP interface

3.1 Conditions of approval - Requirements and commitments schedule

Table 2 Air Quality management requirements

Condition of Approval Reference	Requirement/Commitment Description	Cross Referenced
CoG evaluation Report – Appendix 2, Part B, Construction Management Recommended Condition 33 (a) (vi)	*PART B33(a) Prior to the commencement of works, prepare and submit a Construction Environmental Management Plan (CEMP) to DSDILGP (infrastructuredesignation@dsdmip.qld.gov.au). The CEMP must be consistent with management measures detailed in the project EIS and, and must include/address the following:*	Construction Environmental Management Plan (CEMP)
	PART B33a(vi) dust mitigation methods (such as use of water to suppress potential dust) and air quality management measures, within an Air Quality (Dust) Management Plan	Air Quality Management Plan (this plan) – Management and mitigation measures
CoG Evaluation Report – Appendix 2, Part B, Operation Management Recommended Condition 35 (a) (i)	*PART B35 (a)Prior to commencement of operation, prepare and submit an OEMP to DSDILGP (infrastructuredesignation@dsdmip.qld.gov.au). The OEMP must be consistent with management measures detailed in the project EIS and should include, at a minimum, the below sub-plans:*	OEMP to be developed
	PART B35(a)(i) Air Quality (Dust) Management Plan	
CoG Evaluation Report – Appendix 2, Part B, Greenhouse Gas emissions Recommended Condition 38(a)	*PART B38(a) Prior to commencing the action a greenhouse offset plan is to be developed and implemented for construction and operational phases of the project which is to:* *- include energy efficiency initiatives* *- consider the use of renewable energy sources.*	Greenhouse Gas Offset Plan
CoG Evaluation Report – Appendix 4, Chapter 10 Air and Greenhouse gas, Proponents Commitments Condition C90	*PQ will consider implementation of the following mitigation opportunities for the management of air quality:* • *Development of dust and stockpile management procedures within the Environmental Management Plan.* • *Undertake progressive rehabilitation and stabilisation of disturbed areas in accordance with a rehabilitation plan.* • *Maintain complaints register for the management and tracking of complaints.* • *Development of a Greenhouse as offset plan.*	Air Quality Management Plan (this plan) Section: Management and Mitigation Measures. Rehabilitation Monitoring plan Section: Complaints Protocol. Greenhouse Gas Offset Plan
CoG Evaluation Report – Appendix 4, Chapter 10 Air and Greenhouse gas, Proponents Commitments Condition C91	*PQ will consider implementation of mitigation measures to reduce the production of greenhouse gases with regards to fuel combustion and gas-insulated electrical components.* *Offset strategies will also include the development of a GHG Offset Plan and consideration of options regarding Green Power sources from a renewable source or contributions to another credited offset program. This strategy will depend on Federal and State climate change policy current at the time the Project is approved.*	Greenhouse Gas Offset Plan

3.2 Reference documents

This plan forms part of the CEMP which is a living document and will be updated as required where the scope of works is amended or when a subsequent risk has been identified. All changes will be agreed to by the project key stakeholders and updated by the JV Environmental Team.

The following sub plan should be read in conjunction with the following regulatory submissions, granted approvals and project specific documents.

Table 3 Reference documents

Document title	Document ID / Relevant Sections
CopperString 2.0, Supplement to the Draft Environmental Impact Statement, Volume 4, Jan 2022	Subsection 4.1.1 & section 4.10
CopperString 2.0, Air and greenhouse gas, Volume 2 Chapter 10	Chapter 10 – Air and Greenhouse gas
CopperString Project, Coordinator – General's evaluation report on the environmental impact statement, September 2022	Other Topics- Air Quality and Greenhouse gases, subsection 5.8.2. Appendix 2, Part B Condition 33 & 35 Appendix 4- Condition C90 & C91*
Framework Environmental Management Plan (appendix Q of the EIS)	Section 4.6 Figure 2 (this plan)
CopperString2032, Powerlink – HSE Specification for Contractors and Suppliers	CSPW-HSW-SPE-M8-000001 Section 9
Construction Environmental Management Plan	9310-JV-PLN-CEM-0003
Regulatory Approvals Plan	9310-JV-PLN-RAP-0039
Erosion and Sediment Control Management Plan	9310-JV-PLN-ESC-0045
Vegetation Management Plan	9310-JV-PLN-VMP-0048
Site Environmental Plan (template)	UGLMS-4-2138
Air Quality Management (Knowledge)	UGLMS-5-926
Air Quality Management	UGLMS-131-546

4. Air Quality Management Plan

4.1 Management plan purpose

The Air Quality (Dust) Management Plan has been developed to form part of the Construction Environmental Management Plan (CEMP).

- The CEMP outlines an overarching environmental management plan to Air Quality in Section 18.7.
- This plan details the management of air quality in accordance with EIS and CoG evaluation report and the associated relevant legislative requirements during design, pre-construction and construction activities for the project.

4.2 Management plan objectives

- To ensure and maintain ambient air quality with a minimal environmental impact on nearby sensitive receptors, surrounding neighbourhood and site personnel;
- Ensuring dust and relevant atmospheric emissions generated comply with the regulatory requirements under the EP Act 1994, the EP (Air) Policy 2019 and maintain compliance with the project issued conditions and approvals; and
- Maintain plant and equipment ensuring exhaust emissions are minimised.

4.3 Performance / target criteria

- Compliance with regulatory requirements under EP(Air) Policy 2019;
- Compliance with the Project issued conditions and approvals; and
- No air quality (dust) complaints from the community during construction.

5. Existing Environment

The project area consists predominantly of rural environment used for pastoral and general agricultural purposes.

The EIS study (Chapter 10) for the air quality impact assessment identified sensitive receptors, meteorological regions, and meteorological parameters, which may affect sensitive receptors because of the Project. Potentially affected sensitive receptors included residential premises and other buildings which are in the vicinity of the corridor selection. For the study of the air quality impact assessment, residences within two kilometres of the centre line of the corridor selection or substation site were considered. The review identified 57 sensitive receptors, 55 of these being residential premises, one place of recreation and one workplace, for the purposes of the air quality impact assessment.

The sensitive receptors description and locations are shown in Table 4 below.

No significant risk areas have been identified associated with the project in terms of air quality, based on the review of the existing environment during the EIS study (chapter 10, section 10.3). However, sensitive receptors will be specifically managed through consultation and mitigation to address issues associated with air quality from the Project. Facilities currently being finalised for the project including the workers accommodation facilities will be addressed through the construction Area plans and work packs.

Table 4 Sensitive Receptors - Air Quality

Residential (Unless otherwise noted) Receptor number	Approximate distance from corridor (m)	Coordinates (GDA94 Zones 54-55) (m)	
		Easting	Northing
1	1,866	478,715	7,791,461
2	782	470,070	7,787,999
3	1,739	465,442	7,781,419
4	962	422,731	7,759,354
5	1,743	421,973	7,759,802
6	1,848	354,040	7,720,974
7	1,958	205,273	7,686,069
8	1,549	196,358	7,684,976
9	1,177	768,786	7,686,785
10	1,799	739,942	7,691,521
11	1,695	716,251	7,693,234
12	1,815	700,852	7,691,947
13	1,894	654,981	7,700,778
14	1,893	629,778	7,698,952
15	1,910	613,729	7,697,966
16	1,903	613,659	7,697,973
17	1,876	453,691	7,704,669
18	1,827	448,434	7,707,124
19	1,020	448,214	7,706,232
20	1,732	447,910	7,706,889
21	1,995	343,827	7,702,956
22	882	343,674	7,701,816
23	1,898	343,770	7,702,941
24	1,617	343,671	7,699,317
25	1,585	343,652	7,699,349
26	1,602	343,642	7,699,332
27	1,590	343,618	7,699,344
28	1,667	343,617	7,699,266
29	1,431	343,559	7,702,420
30	1,357	343,550	7,702,320
31	1,933	343,530	7,703,081
32	1,833	343,524	7,702,968
33	1,431	343,497	7,702,481
34	1,723	343,459	7,702,879
35	1,475	343,457	7,702,573

Residential (Unless otherwise noted) Receptor number	Approximate distance from corridor (m)	Coordinates (GDA94 Zones 54-55) (m)	
		Easting	Northing
36	1,370	343,455	7,702,437
37	1,578	343,397	7,702,746
38	1,790	343,360	7,703,014
39	747	343,079	7,701,931
40	914	343,051	7,702,178
41	783	343,051	7,702,011
42	1,151	343,043	7,702,459
43	990	343,028	7,702,282
44	1,315	342,994	7,702,659
45	309	342,944	7,701,240
46	311	342,920	7,701,241
47	318	342,891	7,701,248
48	296	342,866	7,701,243
49	271	342,839	7,701,244
50	250	342,815	7,701,245
51	222	342,787	7,701,245
52 (Mica Creek Power Station) No longer operational	305	342,771	7,701,611
53	199	342,763	7,701,244
54	174	342,737	7,701,246
55	145	342,707	7, 701,249
56	1,878	341,786	7,703,158
57 (Mount Isa Golf Club)	1,862	341,713	7,703,107

A review of potentially affected sensitive receptors along the corridor selection indicates that 46 of the 57 identified sensitive receptors are greater than 750 m from the proposed transmission line. The exceptions to this include sensitive receptors 45-55, which are existing workers accommodation located between approximately 150m and 350m of the existing Mount Isa power stations and electrical substations. Workers accommodation facilities are still in the process of being finalised for the project including detailed design, manning and location. These will be updated through the construction area plans as these are finalised for the project.

5.1 Management and mitigation measures

To minimise air quality impacts the following measures will be implemented as a minimum throughout the project (aligned with the CoG report recommendations):

- Use existing access tracks where possible;
- Minimise haulage distances between construction facilities;
- Minimise excessive ground disturbance during vegetation clearing and construction; and
- Undertake dust suppression actions as necessary.

The below table outlines the detailed mitigation measures for the project Air Quality (Dust) management approach during planning and design, pre-construction stage and construction stages.

Table 5 Management and mitigation measures

Item	Aspect	Control/ Mitigation Measure	Responsibility	Trigger/Applicability	Supporting documentation
1	Training and competency	All personnel will undertake the site environmental induction which covers Air Quality information.	All site personnel (Level 3) - Site	Mandatory training HSEQ inductions	CEMP HSE Specification for Contractors and Suppliers
		Targeted Air Quality toolbox talks, education and awareness campaigns, Notices shall be developed and implemented. This specifically will capture high risk air quality impacts.			
		All staff and contractors shall be required to complete the air quality complaint protocol training.			
2	Planning and design	Commit to use existing access tracks to minimise ground disturbance during vegetation clearing assessment and while ground truthing to identify access tracks for hauling of material and equipment.	Project Design manager	Field investigation/design inputs CoG Report Proponents condition ref C12.	Field Development Plan. CEMP UGLMS-5-926 MSID-2-242
		Maintaining/restricting speed limits on public and private access roads.			
		As part of design an air (dust) quality assessment associated with accommodation hubs will be undertaken to inform assessments on the proposal to operate high-air impacting activities including: - Concrete batching plants - Use of heavy plant and equipment in laydown areas - Increased vehicle access on non-sealed roads/carparks.			
3	Pre-Construction	Sensitive receptors will be identified through a risk assessment and work planning processes and measures to reduce potential impacts will be determined and implemented prior to commencement of works.	The JV Environmental Manger Project manager	CoG Report recommendations	Environmental Aspect register Project Risk Register
		Ensure all vehicles and machinery are fitted with appropriate exhaust systems and devices. Such devices will be maintained in good working order, in accordance	Construction Contractor	Contract requirements	CEMP, Vehicle Pre-starts, Site inspection records

Item	Aspect	Control/ Mitigation Measure	Responsibility	Trigger/Applicability	Supporting documentation
		with the manufacturer's recommendations and the Commonwealth Department of Infrastructure and Regional Development, Australian Design Rules for Vehicle Emissions.	JV Project Site Manager		
		The area of disturbed land will be kept to a minimum and existing vegetated area will be kept intact for as long as possible prior to clearing.	Construction Contractor JV Project Site Manager	CoG Report recommendations	CEMP, Vegetation Management Plan and Land Disturbance Permits
		Prior to construction works, the project will develop a Greenhouse Gas Offset Plan for construction activities. This Plan will address: - Energy efficiency initiatives - Consider the use of renewable energy sources.	Powerlink Queensland	CoG Report Requirements Legislative obligation	Greenhouse Gas Offset plan, CEMP
4	During Construction	Dust management controls to be implemented when undertaking dust generating activities: - Use of water carts for dust suppression where dust is a health and safety hazard, and may impact residences. - Use of soil binders where required - Restricted speeds on access tracks and easements - Restricted access to construction access tracks and easements - Soil stockpiles to be located away from sensitive receptors - Cleared areas within a construction zone to be progressively stabilised as soon as practicable - Dust generating loads being hauled in or out of the construction zones will be covered - A minimum 1,000 m buffer will be maintained between concrete batching plants and sensitive receptors. - Burning of any materials is prohibited onsite. Activity specific dust management controls shall be implemented in accordance with the EWMS, and specific controls as provided in the Erosion Sediment Control Plan.	Construction contractor. JV Project Manager JV site Supervisor	Construction Contract requirements CoG Report recommendations Legislative requirements	CEMP, CLMP Erosion & Sediment Control Plan, Project Risk Register UGLMS-5-926 MSID-2-242
		Controls implemented to address air quality management of stockpiles : - in accordance with activity specific EWMS, Erosion Sedimentation Control plans. - Stabilising / covering all materials stockpiled for longer than one month (excluding pavement materials and screenings)/other dust sources by grassing, erosion blanketing, emulsion spray or other approved method as per the requirements of the CESCP (and approval from PQ)			AQMP (This plan) Erosion & Sediment Control Plan, EWMS

Item	Aspect	Control/ Mitigation Measure	Responsibility	Trigger/Applicability	Supporting documentation
		- Orientating stockpiles in a direction that reduces exposed surfaces to the prevailing winds			
		Dust management controls – Vehicle/ equipment management: - Carry out regular visual surveillance of vehicles, plant and equipment working or moving within proximity to residences or other dust sensitive locations. The surveillance is to determine when actions are required to reduce potential dust nuisance. - Road use speed controls as per traffic Management plans (i.e., <40km/hr) - Covering loads and - Maintaining clean roadways to and from the worksite. Fitting equipment with dust collection/suppression devices (e.g: mulchers and chippers) Avoid or minimise queuing in roadways approaching the worksites or adjacent to other sensitive activities. Minimise queuing of construction vehicles and idling for excessive periods (e.g., more than 5 minutes). All construction plant and equipment must be maintained so they do not emit visible smoke for any period greater than: - 15 consecutive seconds for plant not being registered for use on public roads - 10 consecutive seconds for plant registered for use on public roads.			AQMP (This plan) UGLMS-5-926 MSID-2-242
		Dust management controls – during high winds: - Continuous logging weather stations will be installed on the site for the duration of the Project - Construction activities will be reprogrammed or relocated, if necessary, during periods of strong winds if they produce excessive wind-blown dust. Work will cease where dust has the potential to impact on local community/stakeholders/local parties until additional controls are implemented to eliminate the hazard and minimise dust nuisance at the sensitive receptors. In managing the dust impacts consideration will be given to site conditions, wind direction, wind speed, weather, bushfire smoke soil type and location to sensitive receivers to limit and reduce potential impacts on sensitive receivers. Limit dust inducing activities on days with high levels of bushfire smoke in the air and if wind is blowing towards receptors.			CEMP, AQMP (this plan) Bushfire Management Plan, Construction Management Methodology plan UGLMS-5-926 MSID-2-242
		Air Quality Management Controls – community complaints: - Air quality monitoring will be undertaken based on receipt of non-vexatious complaints. - - The air quality monitoring report will be submitted to Powerlink Queensland	Construction Contractor JV Project Manager	Community Compliant	Community compliant protocol AQMP (this plan)

Item	Aspect	Control/ Mitigation Measure	Responsibility	Trigger/Applicability	Supporting documentation
			JV Environmental Manager		

5.2 Monitoring

Air Quality monitoring will be undertaken based upon receipt of an environmental nuisance complaints and in accordance with the complaints protocol process.
The CEMP monitoring objectives for the air quality management includes:

- Risk based air quality (particulates, dust, other) monitoring for high impacting activities in close proximity to sensitive receptors to verify compliance with air quality objectives.
- Weekly environmental inspections for dust sources/high dust risk activities to determine if controls are effective;
- Pre-start vehicle inspections; and
- Greenhouse gas emissions from use of fuel and electricity and materials.

The table below outlines the monitoring activity and the potential corrective actions to be implemented during the construction phase of the project.

Table 6 Monitoring Activity and corrective action

Monitoring Activity	Responsibility	Frequency	Corrective action
Visual assessment of wind speed and direction during the shift to enable high wind warnings to be issue if required. Report any adverse wind conditions in a site logbook. This allows for possible complaints to be investigated and checked against meteorological conditions that may have caused the dust event	Construction Contractor	Ongoing	Implement measures in dust management measured in CEMP if required. If adverse wind conditions are forecast (strong winds in the direction of nearby sensitive receptors) that could result in a high dust event, review operations schedule and postpone work if required, until such time that meteorological conditions are favourable.
Visual inspection for excessive dust emissions	Construction Contractor	Ongoing	If nuisance dust is observed when working near a residential receptor implement additional dust mitigation measures or reduce dust generating activities.
All complaints relating to air quality will be recorded	Construction Contractor JV Project Manager JV Environmental Manager	Ongoing	Initiate the complaint response protocol.

6. Complaint Protocol

Complaints are to be handled in accordance with the CLMP (0643-JV-PLN-CLM-0004-F). Where there has been receipt of a complaint relating to air quality (dust) nuisance, the following applies:

- Environment Team will need to be notified;
- Environment team must notify PQ, as soon as practical but within 12 hours (verbally or in writing) of complaint;
- Environment team will record the complaint in Synergy as an environmental complaint;
- Environment team will review the complaint within 24 hours and respond to the stakeholder team and PQ with proposed investigation/response;
- Environment team must provide an investigation report covering all aspects of HSE in relation to the complaint/event;
- Environmental Team is to provide weekly progress reports to the stakeholder team until the complaint can be closed. Timeframes may vary depending on the extent and severity of the complaint; however, updates are recommended every three days; and
- Once the situation is resolved, this will be updated and closed out on Synergy as an environmental incident.

Environmental Investigation methods for complaints relating to air quality (dust) will include at a minimum:

- Consultation with the Construction contractor and Project Manager;
- A review of current activities and other potential dust emission sources in consultation with site supervisors;
- Carry out investigation into the cause of the excessive dust event including reference to site logbook and vehicle logbook;
- Assess the meteorological conditions (wind speed, wind direction etc);
- Where necessary, contact the complainant to discuss cause of event and implement air quality (dust) controls as required;
- An inspection of the site to confirm minimum/site specific mitigation measures are compliant in addition to a review of previous inspections (weekly and/or daily);
- A detailed investigation report must be prepared and provided to PQ as per the HSEQ specifications; and
- The investigation report must be a systematic and comprehensive HSE investigation (such as ICAM or to a similar level) which identifies system or control deficiencies and recommends actions to prevent reoccurrence. Investigations will include the following as a minimum:
    - Contractor details (name/s, address, contact information, Contract number);
    - Location, time and date of the incident or event;
    - Detailed description & sequence of the incident or event (including activities leading up to the occurrence);
    - Details of who was notified and the immediate actions taken; and
    - Any identified contributing factors categorised according to:
        - Absent or Failed Defences;
        - Individual/Team Actions;
        - Task/Environmental Conditions; and
        - Organisational Factors.

Environmental compliance investigation results will be recorded in Synergy.

Following the completion of an incident investigation unless otherwise requested by PQ, a document must be submitted to PQ to publicly share appropriate relevant information and learnings. The focus of this ‘Lessons Learnt’ would be to outline the basic nature of the incident and any actions that may help others to

respond accordingly to reduce or eliminate the potential for future similar occurrences and/or injuries. This may consider but not be limited to the distribution of an initial HSE Alert and subsequent post incident lessons learnt briefings and bulletins.

Copies of the internal report will be available to specific personnel upon request, and, when complete, will be provided as part of the subsequent Monthly Environmental Report.

All external communication regarding the complaint will be managed by the community team, unless otherwise requested by the Community and Stakeholder Manager.

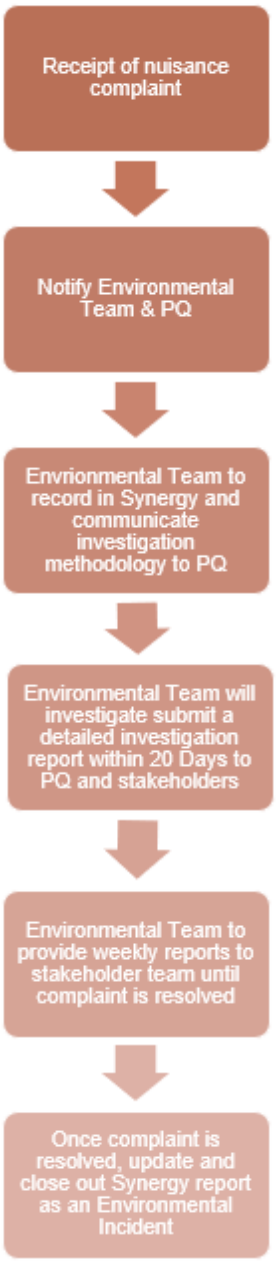

Figure 3 Complaint Management Protocol

7. Reporting

Reporting will only be triggered upon receipt of a complaint in accordance with the CEMP and the Community Liaison Management Plan (CLMP). Reporting will include:

- The receipt of complaint, including the complaint itself;
- Any relevant site logbook recordings;
- Any relevant meteorological reports;
- Air Quality inspections and audit results recorded by a suitably qualified person;
- Results of air quality monitoring undertaken during construction; and
- Air quality related incidents, complaints, or non-conformances.

8. Plan Review and Control

This plan shall be reviewed on a regular basis but not greater than 12 monthly intervals in accordance with the requirements specified in the:

- JV Quality Management System requirements;
- CEMP Review; and
- PQ HSE Specification for contractors and suppliers.

All the Project environmental management documents, review (version history) will be uploaded and maintained through InEight and/or JV's Document Management Systems.

CONTAMINATED LAND ASSESSMENT MANAGEMENT PLAN

COPPERSTRING 2032

EDMS No : CSPW-EVN-PLN-900-000017
Revision : A02
Date : 17/06/2024

Approvals and Reviews

Contaminated Land Assessment Management Plan	
Project	CopperString 2032
Client	Powerlink Queensland
Document Number	CSPW-EVN-PLN-900-000017

Revision History					
Rev No.	Description of Revision	By	Checked by	Approved by	Date
A01	Developed for PDLA Work Contract	Padma Cuppala	David McLean		22/04/2024
A02	Updated in response to comments	Jacinta Fuller	David McLean	Matt Lennon	17/06/2024

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Appendices

Appendix A Unexpected Finds Procedure

Appendix B Contaminated land Reports

Table 1: Abbreviation, Acronyms & Definitions

Term	Definition
The Project	CopperString 2032 Project
UGL CPB JV	UGL, CPB Contractors Pty Limited Joint Venture
PLQ	Powerlink Queensland
CLAMP	Contaminated Land Assessment Management Plan (this plan)
CEMP	Construction Environmental Management Plan
EIS	CopperString Project Environmental Impact Statement documents
CoG Report	CopperString Project Coordinator-General's evaluation report on the environmental impact statement, September 2022
UGLMS	UGL Management Systems
DES	Department of Environment and Science
SDPWO	*State Development and Public Works Organisation Act 1971*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EP Act	*Environmental Protection Act 1994* (QLD)
GED	General environmental Duty
EMR	Environmental Management Register
CLR	Contaminated Land Register
UXOs	Potentially containing unexploded ordnance
EMF	Environmental Management Framework
NWMP	North West Minerals Province
NWPS	North West Power Systems
NEM	National Electricity Market
NQCEH	North Queensland Clean Energy Hub
CLMP	Community Liaison Management Plan

1. Project

1.1 Project Background

The purpose of the CopperString 2032 project is to connect the North-West Minerals Province (NWMP) of Queensland to the National Electricity Grid. This will not only allow existing loads in the Mt Isa and Cloncurry areas to be fed from the National Electricity Market (NEM), but also provide access to new mining opportunities and the connection of future renewable energy generation.

1.2 Project Scope

The CopperString 2032 Project (The Project) is an extra high voltage transmission system intended to connect the North-West Power System (NWPS) near Cloncurry and Mount Isa to the Powerlink network and NEM at Woodstock. Figure 1 provides an overview of the Project.



Figure 1: CopperString 2032 proposed transmission lines and substations

The Project will connect the NWMP to the NEM to reduce the cost of power supply and facilitate the large-scale development of the Hughenden wind resource and solar resources within the North Queensland Clean Energy Hub (NQCEH).

The scope of work, traversing east to west, consists of the following sections:

- Mulgrave Substation and 275kV line augmentation as the CopperString 275kV connection point to the NEM
- Woodstock Substation as the CopperString 500kV connection point to the Queensland SuperGrid
- Pentland 500kV Substation to support the North Queensland Clean Energy Hub (NQCEH) expansion and as the core for future load connections in the area
- Flinders 500/300kV Substation (Hughenden) as the core for the NQCEH
- Dajarra Road 330/220kV Substation (Cloncurry) as the core for distributions to larger load centres
- The primary CopperString transmission backbone
- Termination via the Mount Isa augmentation 220/132kV.

The scope consists of a transmission line between the above locations carrying extra high voltage power transmission at 500kV, 330kV and 220kV respectively. Substations at the interconnecting junctions will distribute power to the NWMP and NQCEH.

2. Project Environmental Management Obligations

The Project involves construction and operation of approximately 1,000km of extra high voltage overhead electricity transmission line that will connect the Northwest power system to the state electricity grid. The project includes six (6) new substations, electricity transmission line and transmission towers every 500-600 meters (m). To support construction of the project six construction camps, site offices, laydown/delivery areas, concrete batching plants, and access tracks to the corridor and along its alignment will be provided. The project also provides for improved communications, with the installation of fibre optic cables.

The Coordinator General (CoG) for the Department of State Development, Infrastructure, Local Government and Planning declared the project to be a 'coordinated project' under *the State Development and Public Works Organisation Act 1971* (SDPWO) requiring an Environmental Impact Statement (EIS) for the Project. In September 2022, the Coordinator General provided an evaluation report (CoG Report) on the submitted EIS for the project. This report includes an evaluation of Matters of National Significant (MNES) with recommended conditions for an approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth). In November 2022, a notification of approval was granted from the Department of Climate Change, Energy, the Environment and Water (DCCEEW) (Commonwealth) under the EPBC Act with conditions specific to the Project.

The CoG report also includes recommended conditions for proposed subsequent Ministerial Infrastructure Designations for consideration under the *Planning Act 2016* (Qld) by the Queensland Planning Minister.

The CoG evaluation was based on the draft and revised EISs, submissions made, public consultation on the draft EIS and advice from relevant Australian, State and Local government agencies.

To address and comply its legislative obligations, the UGLCPB JV has prepared a Regulatory Approvals Plan (refer Fig 2) which identifies the environmental approvals applicable to the Project.

The project scope includes (but not limited to):

- Clearing vegetation and earthworks for a transmission line and ancillary infrastructure (e.g. off-easement access tracks and water sources) involving:
  - Disturbance to Matters of National Environmental Significance
  - Disturbance to Matters of State Environmental Significance
  - Interfering with protected species (flora and fauna) and
  - Works within Native Title claimed areas
  - Land affected by Unexploded Ordnance (UXO)
- Constructing and operating accommodation hubs with facilities including:
  - Clearing regulated vegetation
  - Accommodation units and offices, and carparking (involving building and plumbing and drainage works)
  - Mains connection (power, water and sewerage)
  - Mobile and temporary concrete batching plants
  - Motor vehicle workshop
  - Fuel (chemical) storage
  - Water treatment, for provision of drinking water
  - Wastewater (sewage) treatment
  - Biosecurity washdown bays
- Taking water (surface and groundwater)
- Use of quarry material from commercial sources, although project specific borrow pits may be identified as an opportunity
- Crossing mapped waterways and water courses for access
- Upgrading public roads
- Working within and adjacent to rail corridors
- Disposing of contaminated soil (if found within properties listed on the Environmental Management Register (EMR)).

2.1 Relevant Legislation and Guidelines

Legislation

- *Work Health and Safety Act 2011*
- *Electricity Act 1994*
- *Environmental Protection Act 1994*
- *Planning Act 2016*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *National Environment Protection (Assessment of site contamination) Measure 1999*

Guidelines

- Queensland environmental management register
- Queensland contaminated land register
- Queensland auditor handbook for contaminated land (DES 2018)
- Contaminated land – EIS information Guideline
- State Planning Policy – state interest guidance material, Natural hazards, risk and resilience – Fire, 2017
- AS 4482.2-1999 Guide to the sampling and investigation of potentially contaminated soil – Volatile substances
- AS 4482.1-2005 Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds.

2.2 Contaminated Land Reports

The effective management of contamination on the project has been addressed through the investigation of site contamination risks across the project. This is a current and ongoing assessment undertaken by Douglas Partners Pty Ltd for the JV. This assessment looks at the potential likelihood of contamination occurring on the project.

These investigation reports identify and recommend treatments and management approaches associated with the project's development. These will be implemented wherever appropriate for the project where the impacts on contamination hazards cannot be avoided.

The Contaminated land investigation reports undertaken by Douglas Partners Pty Ltd will form an addendum to this management plan (refer to Appendix B).

3. Management Plan Interface

This Contaminated Land Assessment Management Plan (CLAMP) is an overarching environmental sub- plan, informing the Construction Environmental Management Plan (CEMP) as identified in the Environmental Management Framework (Figure 2).

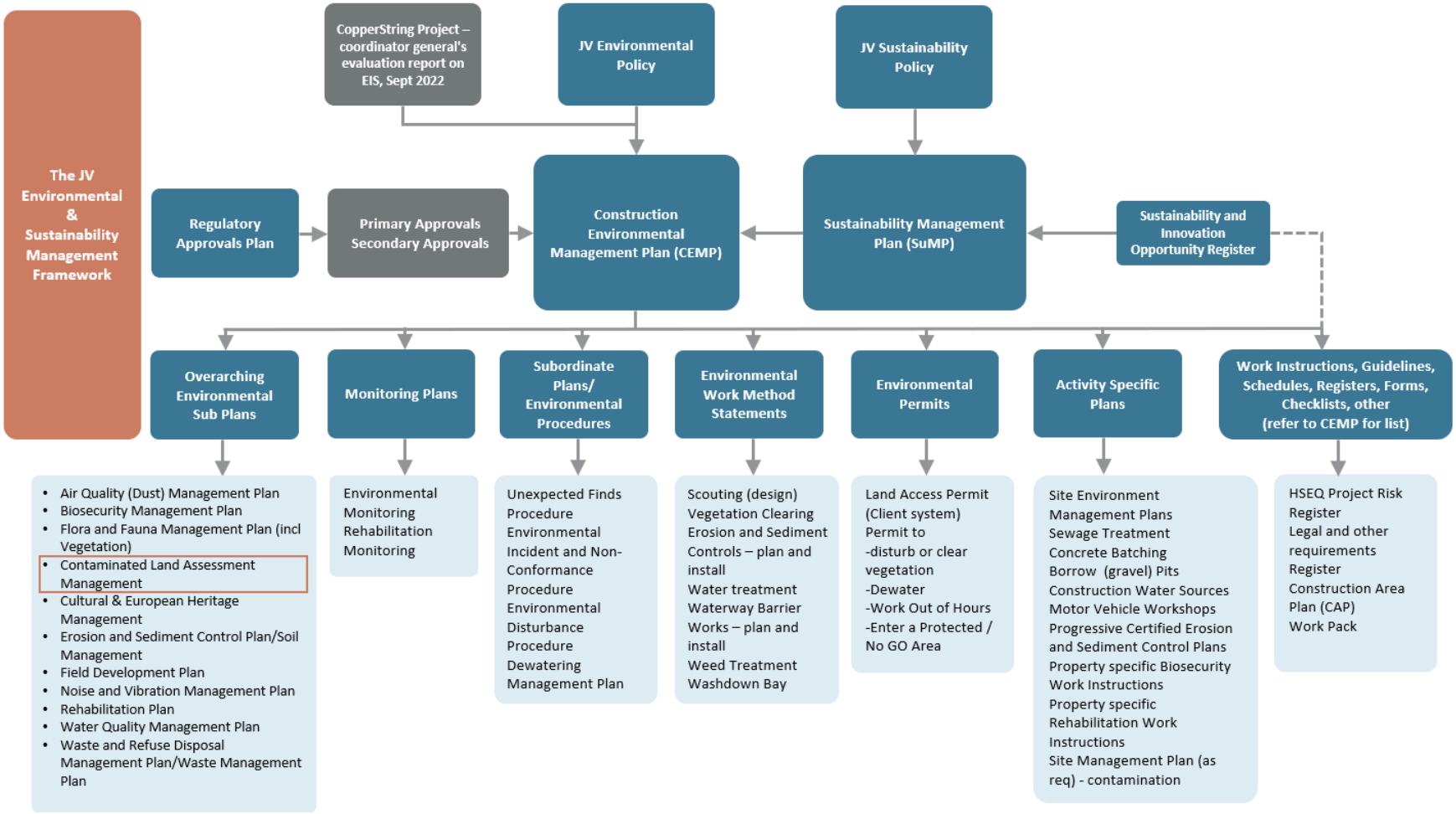


Figure 2:Environmental Management Framework - CLAMP Interface

3.1 Conditions of Approval – Regulatory and commitments Schedule

Table 2: Contaminated Land Management Requirements

Condition of Approval Reference	Requirement/Commitment Description	Cross Referenced
CoG evaluation Report – Appendix 2, Part B, Contaminated land Recommended Condition 31 (a) &(b)	*Part B31(a): Project components and activities are to be located away from potentially contaminated land.*	CEMP, CLAMP (this Plan) & unexpected finds procedure
	Part B31(b): The Australian Government Department of Defence must be consulted prior to the commencement of the action to ensure avoidance of any unexploded ordnance.	Community and stakeholder engagement plan, CEMP, CLAMP (this Plan) & unexpected finds procedure
CoG evaluation Report – Appendix 2, Part B, Contaminated land Recommended Condition 33 (a) (x)	*PART B33(a) Prior to the commencement of works, prepare and submit a Construction Environmental Management Plan (CEMP) to DSDILGP (infrastructuredesignation@dsdmip.qld.gov.au). The CEMP must be consistent with management measures detailed in the project EIS and, and must include/address the following:*	Construction Environmental Management Plan (CEMP)
	PART B33a(x) measures to manage any contaminated land	CLAMP (this plan) – section- management and mitigation measures & unexpected finds procedure
CoG Evaluation Report – Appendix 2, Part B, Operation Management Recommended Condition 35 (a) (iii)	*PART B35 (a)Prior to commencement of operation, prepare and submit an OEMP to DSDILGP (infrastructuredesignation@dsdmip.qld.gov.au). The OEMP must be consistent with management measures detailed in the project EIS and should include, at a minimum, the below sub-plans:*	OEMP to be developed
	PART B35(a)(iii) Contaminated Land Management Plan	
CoG Evaluation Report – Appendix 4, Chapter 5 Land, Proponents Commitments Condition C34, C44 &C45	*PART C34: Final design of the Corridor selection will avoid or be suitably distanced form areas including areas of:* *Cultural significance* *Contaminated lands* *Historical working and existing infrastructure*.	Planning and design
	PART C44: Disturbance to potentially contaminated land will be avoided as far as practical through discussion with landholders to further delineate known sites and identify potential contamination on properties not listed on the EMR. Site Project infrastructure and activities will be located away from potentially contaminated land as far as practical.	CLAMP (this plan), Report on Preliminary Site investigation for contamination, CopperString 2.0 Project, Douglas Partners Report, Oct 2023.
	PART C45: Further consultation with landholders and other stakeholders such as the Department of Defence will be undertaken to further define UXO risk	Community and stakeholder engagement plan, CEMP, CLAMP (this

Condition of Approval Reference	Requirement/Commitment Description	Cross Referenced
		Plan) & unexpected finds procedure
CoG Evaluation Report – Appendix 4, Chapter 19 Environmental Management Proponents Commitments Condition C153(b) and C153(c)	C153(b): As part of the Construction Environmental Management Plan, various sub-plans will be developed and implemented in relation to the environmental aspects for the Project … Contaminated land …	CLAMP (this plan)
	C153(c): As part of the Operational Environmental Management Plan, various sub-plans will be developed and implemented in relation to the environmental aspects for the Project … *Contaminated Land Management Plan* …	OEMP to be developed post construction
CopperString 2032, Powerlink – HSE Specification for Contractors and Suppliers, version B (HSE Specification)	*S9.12(Contaminated land):* The Contractor must ensure no unauthorised movement of contaminated material offsite and the management of existing land contamination must be in accordance with the relevant approval/ permit or tracking information. All plant and equipment must be operated and maintained to eliminate or minimise the risk of the escape of contaminants to the environment. All waste products and hazardous substances with the potential to cause contamination must be appropriately stored and managed to prevent an accidental release of contaminants to the environment. Spill response material and equipment must be available in proximity to potential contamination sources with sufficient capacity to contain and control. In the event of a release of contaminants to ground, spill response measures must be immediately deployed (where safe to do so) to contain and clean up the spill. Workers must comply with any Site Management Plan applicable to a contaminated land parcel. Prior to undertaking soil disturbing work on land parcels listed on the Environmental Management Register (EMR) or Contaminated Land Register (CLR), soil testing will be undertaken in accordance with the following: Soil sampling and analysis must be in accordance with AS4482.1-2005 Guide to the investigation and sampling of sites with Potentially Contaminated Soil – Part 1: Non-volatile and semi-volatile compounds; In situ soil samples are to be collected prior to excavation from the nominated excavation works area, at a frequency of either 1:10 metres for trenches or 1:100 m2 for non-trench areas. Where in situ soil is not possible, soil stockpile sampling is to be undertaken at a rate of 1:25 m3 up to 500 m3, and 1:50 m3 for soil quantities greater than 500 m3.	CLAMP (this plan), Report on Preliminary Site investigation for contamination, CopperString 2.0 Project, Douglas Partners Report, Oct 2023.

Condition of Approval Reference	Requirement/Commitment Description	Cross Referenced
	All soil samples will be analysed for the following: • pH; • Heavy metals (Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Zinc and Mercury) – total and TCLP; • Total recoverable hydrocarbons (TRH); • Benzene, Toluene, Ethylbenzene, Xylenes and Naphthalene (BTEXN); • Polycyclic aromatic hydrocarbons (PAHs); • Asbestos presence If the land parcel is an existing substation that is > 25 years old, samples will also be analysed for: • Polychlorinated biphenyls (PCBs) • Organochlorine pesticides (OCPs); • Organophosphorus pesticides (OPPs) At least one soil sample will also be analysed for cation exchange capacity (CEC), clay content (% clay), and total organic carbon content (TOC). This sample should also be at least 500 g to enable clay content analysis to be completed. Analysis for additional potential contaminants may be required based on the EMR/CLR listing specific details. If evidence of contaminated soil or a contamination source is identifying during work (such as oil staining, buried asbestos sheeting, surrounding previous land use or previous land use of herbicides or pesticides), soil sampling, investigation, and/or notification will be required in accordance with (i) to (v). If soil analysis identifies a contaminant above the soil assessment criteria (SAC) for the relevant land use criteria, and the contaminant is causing or is likely to cause serious or material environmental harm, the Regulator must be notified. A soil disposal permit is required where soil is to be removed from a parcel of land on the EMR/CLR where testing identifies that contaminants are present that exceed the sensitive land-use criteria (i.e., Health Investigation Level (HIL-A) and Health Screening Level (HSL-A/B)).	

3.2 Reference Documents

This plan forms part of the CEMP which is a living document and will be updated as required where the scope of works is amended or when a subsequent risk has been identified. All changes will be agreed to by the project key stake holders and updated by the environmental team. The following sub plan should be read in conjunction with the following regulatory submissions, granted approvals and project specific documents.

Table 3: Reference Documents

Document title	Document ID / Relevant Sections
CopperString 2.0, Draft Environmental Impact Statement, Volume 2, Jan 2022	Subsection 4.1.1 & section 4.10
CopperString 2.0, Volume 2 Chapter 5, Land	Subsection 5.3.12, 5.4.5 & 5.4.6
CopperString Project, Coordinator – General's evaluation report on the environmental impact statement, September 2022	Section 5, Appendix 2, and Appendix 4
Framework Environmental Management Plan (appendix Q of the EIS)	Section 3 Figure 2 (this plan)

Document title	Document ID / Relevant Sections
CopperString 2032, Powerlink – HSE Specification for Contractors and Suppliers, version B	CSPW-HSW-SPE-M8-000001 Section 9
Construction Environmental Management Plan	9310-JV-PLN-CEM-0003
Regulatory Approvals Plan	9310-JV-PLN-RAP-0039
Erosion and Sediment Control Management Plan	9310-JV-PLN-ESC-0045
Vegetation Management Plan	9310-JV-PLN-VMP-0048
Site Environmental Plan (template)	UGLMS-4-2138
Environmental Management Plan Template	UGLMS-4-2174, Version 4
Environmental Inspection Weekly Checklist (Form)	UGLMS-4-1549, Version 8
Environmental Monitoring Instructions (Knowledge)	UGLMS-5-1229 Version 2.0
Manage Contaminated Land Procedure	MSID-2-245
Manage Soil and water procedure	MSID-2-308
Develop Construction Area Plans	MSID-2-574

4. Contaminated Land Assessment Management Plan

4.1 Management Plan Purpose

The Contaminated Land Assessment Management Plan has been developed to meet the requirements under the:

- The Project's Construction Environmental Management Plan (CEMP), section 18.11
- Draft EIS and the CoG evaluation report on the EIS
- CopperString 2032, Powerlink – HSE Specification for Contractors and Suppliers, version B
- Relevant legislative requirements associated during planning & design, pre-construction and during construction activities for the Project.

This management plan is intended to address the risks associated with potential contamination across the project.

4.2 Management Plan Objectives

The contaminated land assessment management plan objectives are to:

- Prevent contamination of land resulting from Project activities
- Ensure no health risk or environmental harm occurs as a result of contaminated sites disturbed by the Project's construction activities.
- No impact on local waterways from contaminated material leachate
- Ensure appropriate management implemented as a result of identifying contamination
- Provide specific information to PQ on these sites and management requirements for consideration.

These contaminated land investigations are being undertaken for the project encompassing the assessment and identification of potential contamination from the project.

4.3 Performance/ Target Criteria

The outcome of the contaminated land investigation underway is to ensure the risk to the environment and the community is appropriately managed and mitigated for the project. This includes achieving the following criteria.

- Minimise disturbance of contaminated material in-situ within the easement or at substation, CEV, temporary workers accommodations camp sites or laydown areas.
- No movement of contaminated material offsite without appropriate approvals
- No contamination of soil as a result of the Project activities
- Appropriately manage complaints from land holder and community during construction and operation.

5. Existing Environment

The Project traverses approximately 139 land parcels, including parcels impacted by sub stations and CEV hut sites. The impacted land parcels are predominantly public and private rural land uses generally being agricultural production from relatively natural environment (e.g. cattle grazing) with individual land parcels being a mix of freehold and leasehold land.

Some of the regions traversed by the Project area are subject to numerous mining and exploration activities. Chapter 5 of the EIS Volume 2 describes in detail the existing land use and potential land use impacts associated with the construction and operation of the Project and associated infrastructure.

The EIS review of the properties within the Project area found none listed on the Contaminated Land Register (CLR). Seventeen (17) properties are listed on the Environmental Management Register (EMR) due to notifiable activities that have the potential to cause land contamination. These properties identified on the EMR are in the Table 4 and the corresponding location are in figure 3-5.

During the detailed survey of the easement and associated temporary construction sites, inspection for signs of contamination would be undertaken on properties listed on the EMR or where discussion with landholders indicated potential contamination on properties not listed on the EMR.

UGLCPBJV have engaged Douglas Partners consultants to complete a preliminary site investigation for contamination (PSI) report for the project. The objective is to:

- Investigate the nature and extent of contamination, if any, in the proposed construction areas of six substations and five campsites through a limited assessment of soil within the footprint of the construction areas;
- Where these issues are identified, and further investigation is required recommend the approach for further investigation.
- Establish the requirement for remediation, management or if further investigation is necessary to delineate any identified contamination and define the risk before proceeding with construction.

The Contaminated land investigation reports undertaken by Douglas Partners Pty Ltd will form an addendum to this management plan (refer to Appendix B).

Table 4: Properties identified in the EMR

Lot/Plan	Notifiable Activity	Description	Traversed alignment
Lot 4026 on SP112067	Livestock dip or Spray race	Satellite imagery confirms the corridor selection is not in proximity to the existing stock yards or buildings. Livestock dip or spray race are likely to be located with stock yards or buildings	KP 29-38WD
Lot 4548 on PH2196			KP 41-46WD

Lot/Plan	Notifiable Activity	Description	Traversed alignment
Lot 4004 on SP242524	Explosives production or storage Landfill Mine wastes Petroleum product or oil storage	Previous EIS confirmed Notifiable Activities were associated with the previously operated open-cut Robinson Crusoe Mine (abandoned areas still evident on satellite imagery) Mining lease present approximately 100 m south of the corridor selection. ML 10344 has been granted to Denjim Pty Ltd, which expires November 2029.	KP 55-60WD
Lot 4924 on SP308339	Livestock dip or Spray race	Satellite imagery confirms the corridor selection is not in proximity to the existing stock yards or buildings. Livestock dip or spray race are likely to be located with stock yards or buildings	KP 59-63WD
Lot 300 on SP137135	Chemical Manufacture or Formulation	Notifiable activity is associated with the open-cut Thalanga Copper Mine (under ML 1571 and 1734), more than 6 km south of the corridor selection.	KP 109-111WD
Lot 4 on DV463	Livestock dip or Spray race	Satellite imagery confirms the corridor selection is not in proximity to the existing stock yards or buildings. Livestock dip or spray race are likely to be located with stock yards or buildings	KP 131-151WD
Lot 61 on GF812272			KP 170-181WD
Lot 28 on GF154			KP 189-213WD
Lot 1 on BD2			KP 669-683WD
Lot 23 on SP136472	Hazardous contaminant	Contamination may be associated with rail operations No earthworks are proposed in rail easements. The corridor selection would span over the rail easement and as such would have minimal risk.	KP 732WD-733WD
Lot 922 on SP137139	Gun, pistol or rifle range	Identified through landholder consultation	KP 41-49DM
Lot 69 on SP223507	Mine wastes	Mining leases present within the property. The alignment does not traverse any mining lease. The closest mining lease is approximately 3.2 km to the west.	KP 57-70DS
Lot 13 on SP223510 (formerly Lot 13 on SP150177)	Engine reconditioning works Landfill Petroleum product or oil storage Mine wastes	Mining leases present within the property The corridor selection does not traverse any mining lease but is adjacent to Phosphate Hill Mine (under ML 5543, operated by Incitec Pivot Limited). Consultation with Incitec Pivot Limited occurred during the corridor selection and the Project would not impact on any existing mining infrastructure where contamination is likely to occur	KP 80-90DS KP 0-62SP
Lot 1 on SP150176	Chemical storage Fertiliser manufacture Landfill Mine wastes Petroleum product or oil storage	The property is dominated by Phosphate Hill Mine (operated by Incitec Pivot Limited), which have activities that can be associated to the identified notifiable activities. Consultation with Incitec Pivot Limited occurred during the Project substation and corridor selection and the Project would not impact on any existing	KP 63-63.38SP

Lot/Plan	Notifiable Activity	Description	Traversed alignment
		mining infrastructure where contamination is likely to occur.	
Lot 5364 on SP278014 (formerly Lot 5364 on PH1891)	Mineral processing Chemical storage Engine reconditioning works Landfill Petroleum product or oil storage Mine wastes Explosives production or storage	Mining leases present within the property. Three (ML2734, 2735 and 2736) of which are traversed by the corridor selection. These mining leases are owned by Chinova Resources Cloncurry Mines Pty Ltd. Consultation with Chinova Resources Cloncurry Mines Pty Ltd. Occurred during the corridor selection and the Project would not impact on any existing mining infrastructure where contamination is likely to occur	KP 91-129.247DS KP 0-2SC
Lot 10 on SP258128	Landfill	Landfill likely to be associated with the previous open-cut Mt Leyshon Mine (ML 10144) operated by Leyshon Resources Pty Ltd and Newmont Australia Ltd.	KP 103-109WD
Lot 101 on SP248023	Gun, pistol, or rifle range	Site identified through landholder consultation and satellite imagery.	KP 72–90DM

Unexploded ordnance (UXO) is ammunition such as artillery shells, mortar bombs and grenades that did not explode when used. It is a potential safety risk because it may detonate, if disturbed. It may also release chemicals that pose a risk to human health and the environment. In Queensland, it is mostly found on land formerly used by Australian and Allied Defence Forces for the live firing of explosive ordnance, particularly during World War II. Department of Defence UXO mapping identifies seven properties that may have UXO as detailed in Table 6 and figure 3-5.

Table 5:Properties identified in the UXO search

Lot/Plan	UXO Category	Traversed alignment
Lot 4004 on SP242524	Slight occurrence to substantial occurrence	KP 55-60WD
Lot 386 on AP2788	Slight occurrence	KP 51-55WD
Lot 4924 on SP308339	Slight occurrence	KP 59-63WD
Lot 511 on PH459	Slight occurrence Other	KP 58-71WD
Lot 3 on DV686	Other	KP 71-78WD
Lot 4404 on PH857	Other	KP 78WD
LOT 2461 on PH293	Other	KP 78-86WD

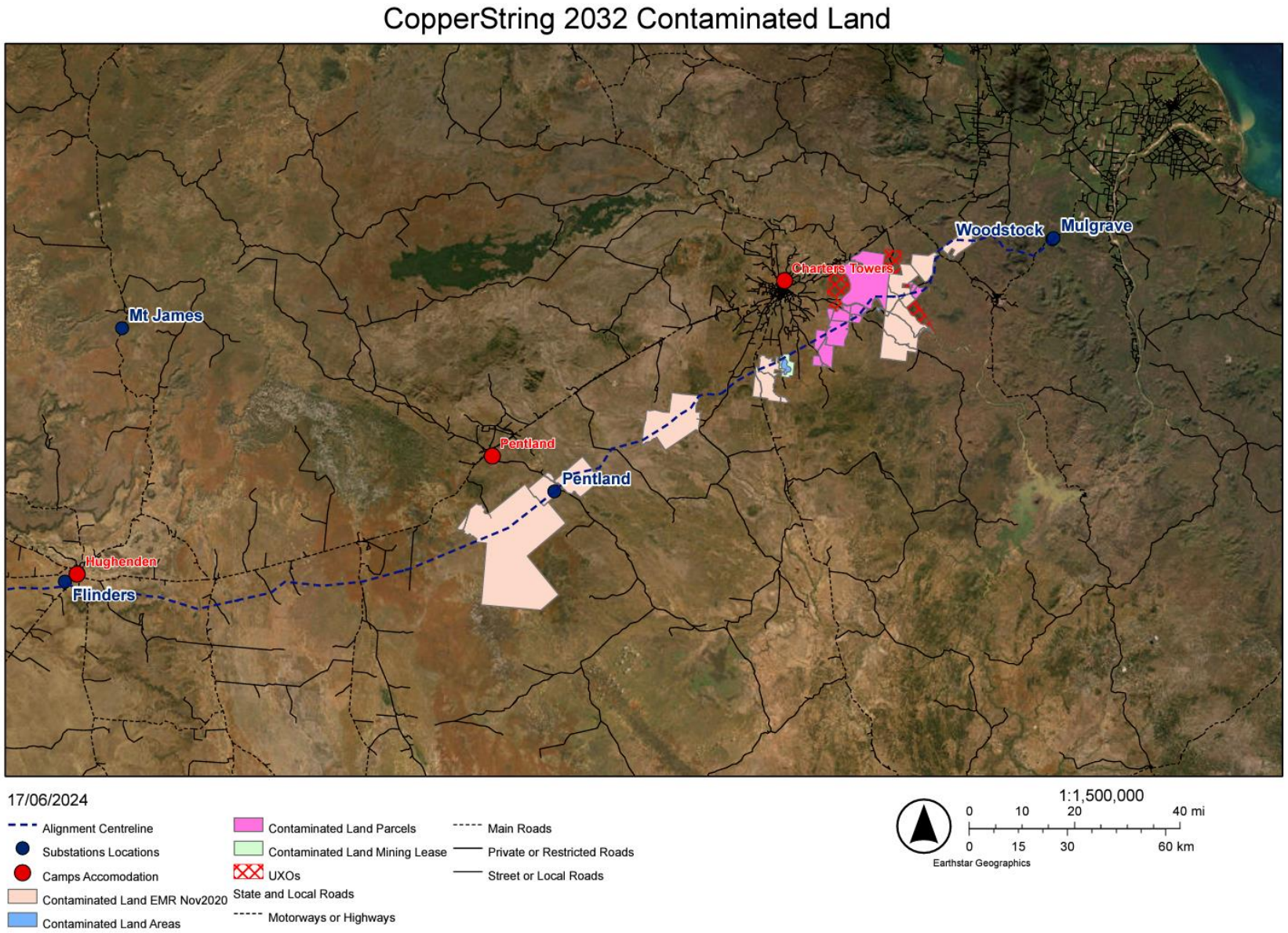


Figure 3: EMR listed land parcels and identified UXO (page 1 of 3)

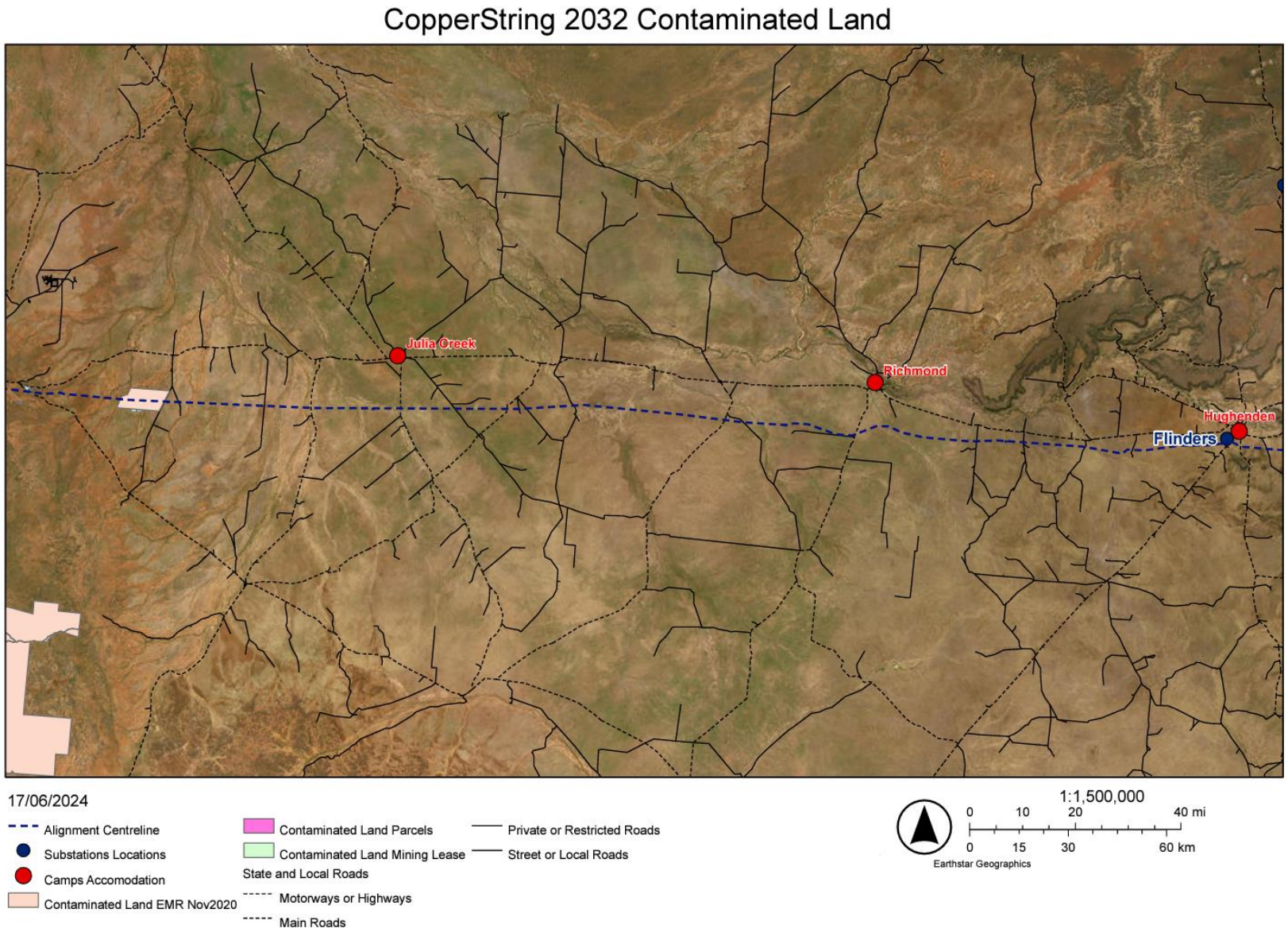


Figure 4: EMR listed land parcels and identified UXO (page 2 of 3)

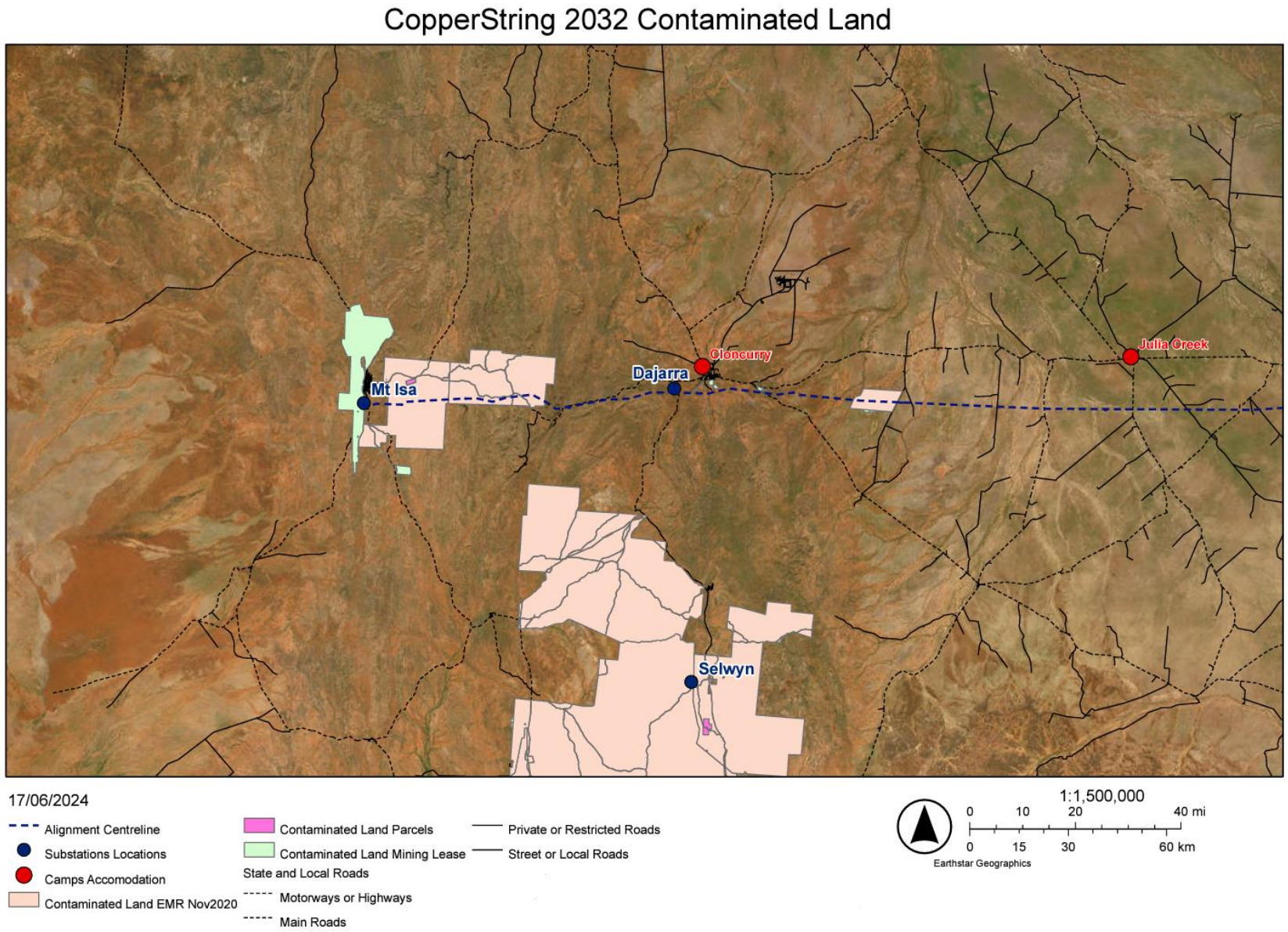


Figure 5: EMR listed land parcels and identified UXO (page 3 of 3)

5.1 Management and mitigation measures

The table below outlines the mitigation measures for the project Contaminated Land assessment Management approach during the planning, design, pre-construction and construction stages.

Table 6: Management and mitigation measures

Aspect	Mitigation Measure	Responsibility	Trigger/Applicability	Documentation
Design	Prior to construction a detailed survey will be undertaken of the preferred alignment, associated with scouting to confirm any presence of UXO or contaminated land based on visual indicators. For UXO, visual indicators will be determined in consultation with the Australian Government Department of Defence. Key focus will be at the 7 potential properties which may contain UXOs east of Charters Towers. For contamination (including acid sulfate soils), field indicators will include: • Discolouration of soil • Wastes mixed with soil • Iron staining • Dead/dying vegetation • Strong smell of rotten eggs from the soil/water environ • Evidence of infrastructure associated with a notifiable activity, e.g. livestock dip, spray race.	Project Design Manager JV environmental Manager	Listed in EMR and identification on the contaminated land CEMP HSE Specification Legal requirement	Report on an Environmental Site Investigation (Contamination) Proposed Campsites and Substations, CopperString by Douglas partners CLR, EMR CEMP

Aspect	Mitigation Measure	Responsibility	Trigger/Applicability	Documentation
	The final design will seek to avoid UXO and contaminated land disturbance through refinement of tower siting and stakeholder consultation. During the detailed survey of the easement and associated construction sites, inspection for signs of contaminated sites will be completed on properties listed on the CLR/EMR			
Pre-construction	If no record of an EMR or CLR listing is found and contamination has been discovered, geotechnical investigations are undertaken prior to construction. This will include an assessment for the presence of any unforeseen actual or potential contamination prior to excavation or other earthworks for sites listed on the EMR or where suspected contamination exists. Should contamination be confirmed, on-site remediation of contaminated soil is considered best practice subject to the contaminants present, with removal of contaminated soil for treatment or disposal off-site only to be carried out when that option is not practicable.	Project Design Manager JV environmental Manager	Listed in EMR and identification on the contaminated land CEMP HSE Specification Legal requirement	Report on an Environmental Site Investigation (Contamination) Proposed Campsites and Substations, CopperString by Douglas partners CEMP, EMR and CLR

Aspect	Mitigation Measure	Responsibility	Trigger/Applicability	Documentation
	A Soil Disposal Permit must be obtained from the Regulator to remove contaminated soil for treatment or disposal from land listed on EMR or CLR.			
Pre-construction	Where areas of acid sulphate soils have been identified or are likely. The Contractor must ensure no release of contaminants from the oxidisation of acid sulphate soils (ASS) outside the work area or into any sensitive receiving environments by undertaking the following: • Prior to any soil excavation work in high-risk areas (below 5 m AHD), undertake investigations in accordance with the Queensland Acid Sulphate Soils Technical Manual to determine the presence of ASS. • Where ASS has been identified, ASS Management Plan is to be developed in accordance with the Queensland Acid Sulphate Soils Technical Manual. • All staff and contractors undertaking soil disturbing work in high-risk areas or where ASS has been identified, must complete training/ awareness on the identification and management of ASS.	Construction contractor Project Design Manager JV environmental Manager	CEMP HSE Specification Legal requirement	Report on an Environmental Site Investigation (Contamination) Proposed Campsites and Substations, CopperString by Douglas partners CEMP

Aspect	Mitigation Measure	Responsibility	Trigger/Applicability	Documentation
Pre-construction	Where disturbance to known contamination (based on field indicators) is proposed based on design, undertake a targeted investigation to confirm contamination and acid sulfate soils, specifically soil sampling in accordance with relevant standards and specifications. The investigation will identify construction requirements and whether to: • Notify contamination under general environmental duty triggers • Prepare a dedicated Site Management Plan (for contamination) for approval by the Regulator • Prepare a dedicated Acid Sulfate Soil Management Plan. Contaminated Land sampling and analysis as referenced in section 9.11 of HSE Specification will be undertaken where required as part of the investigation.	JV environmental Manager	CEMP HSE Specification Legal requirement	Report on an Environmental Site Investigation (Contamination) Proposed Campsites and Substations, CopperString by Douglas partners CEMP, EMR and CLR
Pre-Construction	Workers must comply with any site management plans applicable to a contaminated land parcel	JV Site supervisor Construction contractor	HSE Specification	Environmental work Method Statement and/or Site Environment Plan
Pre-construction	Where disturbance to UXOs and contaminated land has potential to occur based on detailed survey and stakeholder consultation, develop	JV Site supervisor Construction contractor	Copperstring 2032- PLQ's HSE specifications for contractor and suppliers.	Report on an Environmental Site Investigation (Contamination) Proposed Campsites and Substations,

Aspect	Mitigation Measure	Responsibility	Trigger/Applicability	Documentation
	an Unexpected Finds Procedure to document the steps in the event of a discovery. The unexpected finds procedure for UXO and contamination finds can be combined with the unexpected finds procedure for cultural and European heritage.	JV environmental Manager	Legal requirement	CopperString by Douglas partners CEMP, EMR and CLR
Pre-construction	Development of the relevant environmental work plan to include: • Classification of soil to be excavated prior to works commencing in accordance with relevant standards, guidelines and regulations. • A procedure for managing unexpected encounters of contaminated material (including asbestos) including soil sampling and classification processes, stop work processes, notification and reporting requirements; • A procedure for the handling, storage and disposal of contaminated material; • Storage and stockpiling of suspected or contaminated soils in clearly identifiable, separate stockpiles within the construction footprint. Transport and disposal shall be conducted in accordance with DES requirements, dependent on the	Construction contractor/ in consultation with JV project manager and JV Environmental Manager	HSE Specification Legal requirement	CEMP, Project Risk register, individual environmental work plan Report on an Environmental Site Investigation (Contamination) Proposed Campsites and Substations, CopperString by Douglas partners

Aspect	Mitigation Measure	Responsibility	Trigger/Applicability	Documentation
	classification of the contaminated material • Transport by appropriately certified contractors with waste transport certificates completed and copies of records, tracking the movement of contaminated material, to be maintained and available for inspection.			
Construction	In the event an unexploded UXO and contaminated land, all works must cease in accordance with the unexpected finds procedure. The area will be barricaded and signed with exclusion signage (No-go zone). Powerlink and the police will be immediately notified to instigate a request for Defence personnel to attend and dispose of the item. Without disturbing the item, a photograph, description of the item and the exact location will be recorded and its location safely marked. The Supervisor must notify the Environment Manager with the details. The Environment manager will determine next steps of the procedure that are applicable including: • Supervision requirements	Construction contractor JV site supervisor JV Environmental Manager	Copperstring 2032- PLQ's HSE specifications for contractor and suppliers	CEMP, environmental work method statement and Unexpected Finds Procedure

Aspect	Mitigation Measure	Responsibility	Trigger/Applicability	Documentation
	• Management controls • Disposal methods. Works are not to recommence without approval from the Environment Manager.			
Construction	Where known UXO and contamination is to be disturbed, comply with the relevant dedicated plan developed pre works. Compliance with dedicated plans may include: • Treatment/remediation • Disposal and verification. When disturbing UXO or contaminated land, a suitably qualified person will be present to supervise the works. The disturbance of the UXO or contaminated land will be undertaken prior to any immediate earthworks in the vicinity, preferably pre-construction if this is coordinated with other early works programs.	JV Supervisor Suitably Qualified personnel JV Environmental manager	HSE Specification Legal requirement CoG evaluation report of	Disturbance Permits, Project Risk Register CEMP, Unexpected finds procedure.
Construction	All waste products and hazardous substances with the potential to cause contamination must be appropriately stored and managed to prevent an accidental release of contaminants to the environment.	JV Site Supervisor JV Environmental Manager Construction Contractor	HSE Specification Legal requirement CoG evaluation report	CEMP and industry best practice

Aspect	Mitigation Measure	Responsibility	Trigger/Applicability	Documentation
Construction	Spill response material and equipment must be available and in proximity to potential contamination sources and with capacity to contain and control. In the event of a release of contaminants to ground, spill response measures must be immediately deployed (where safe to do so) to contain and clean up the spill.	JV Site Supervisor JV Environmental Manager Construction Contractor	HSE Specification	CEMP
Construction	If evidence of contaminated soil or a contamination source is identified during work (such as oil staining, buried asbestos sheeting, surrounding previous land use or previous land use of herbicides or pesticides), soil sampling, investigation, and/or notification will be required.	JV Site Supervisor JV Environmental Manager Construction Contractor	HSE Specification	CEMP, Project Risk register, individual environmental work plan Report on an Environmental Site Investigation (Contamination) Proposed Campsites and Substations, CopperString by Douglas partners
Construction	The site shall be left in a clean and tidy condition after completion of works to the satisfaction of the relevant landholder. The site is to be progressively rehabilitated to a safe and stable condition as construction progresses. Rehabilitation protocols and monitoring requirements are to be agreed with relevant landholders	Construction contractor JV Site supervisor Community engagement team	HSE Specification	CEMP, Construction management methodology, environmental work plans Rehabilitation management plan and CLMP. Site inspections

Aspect	Mitigation Measure	Responsibility	Trigger/Applicability	Documentation
	and CuString prior to commencement of the project.			
Whole project	Areas containing contaminated soils will be avoided. In the event that excavation of contaminated soils is required, soil will be remediated on site or disposed of at a licenced waste disposal facility.	JV project manager/ Environment manager and construction contractor	HSE Specification	CEMP, environmental work plans, Waste Management plan. Waste disposal permits.
Whole Project	Prior to the transport or disposal of “contaminated soil” (as defined in the Environmental Protection Act 1994) from a property listed on the EMR or CLR obtain a Soil Disposal Permit. Soil Disposal permits are only issued for the removal of contaminated soil to licensed waste disposal or treatment facilities that are able to receive the soil. Written acceptance from the owners of licensed waste disposal or treatment facility where the soil is to be received must be obtained prior to disposal and made available to Powerlink upon request. The contractor must advise Powerlink if works require movement of any soil (for disposal or stockpiling) from a land parcel listed on the EMR or CLR (including to an adjacent land parcel).	JV project manager/ Environment manager and construction contractor	HSE Specification	CEMP, environmental work method statement, Site environment plan and Waste Management plan. Waste disposal permits.

5.2 Monitoring

The CEMP monitoring objectives for the contaminated Land Assessment management includes:

- Scouting will inspect for UXO and evidence of contamination (e.g. Former/current livestock dips, mine wastes, chemical storage, landfills)
- Weekly environmental inspections to verify unexpected finds process followed, if applicable.
- Investigations and monitoring in the event of contamination

Table 7: Monitoring Activity and corrective action

Monitoring Activity	Responsibility	Frequency	Corrective action
All movement of soils and other material on and off the lots listed on the EMR within the Project easement and other sites will be monitored and recorded.	Construction Contractor, JV Site Supervisor, JV environmental Manager	Ongoing	Remediation or disposal of contaminated soil in accordance with legislative requirements
Storage areas will be regularly inspected to assess condition and appropriateness of storage	Construction Contractor, JV Site Supervisor, JV environmental Manager	Ongoing	Complete environmental monitoring in accordance with the environmental monitoring checklist and notify as per the requirements under the HSE Specification.
All incidents or release of material to the environment shall be reported as soon as practical to the Environmental Representative. Emergency response shall commence immediately. Incidents that results in serious environmental harm or material environmental harm shall be reported to DES (refer to section 3.4).	Construction Contractor, JV Site Supervisor, JV environmental Manager	Ongoing	Notify and report in accordance with the HSE Specification Unexpected find procedure.

6. Reporting

Reporting for the project will be triggered upon finding and managing unexpected encounters of new

- Contaminated material
- Unexpected finds (UXO) Or cultural Heritage finds (managed via CHMP)

This will be reported in accordance with the unexpected finds procedure.

7. Plan Review and Control

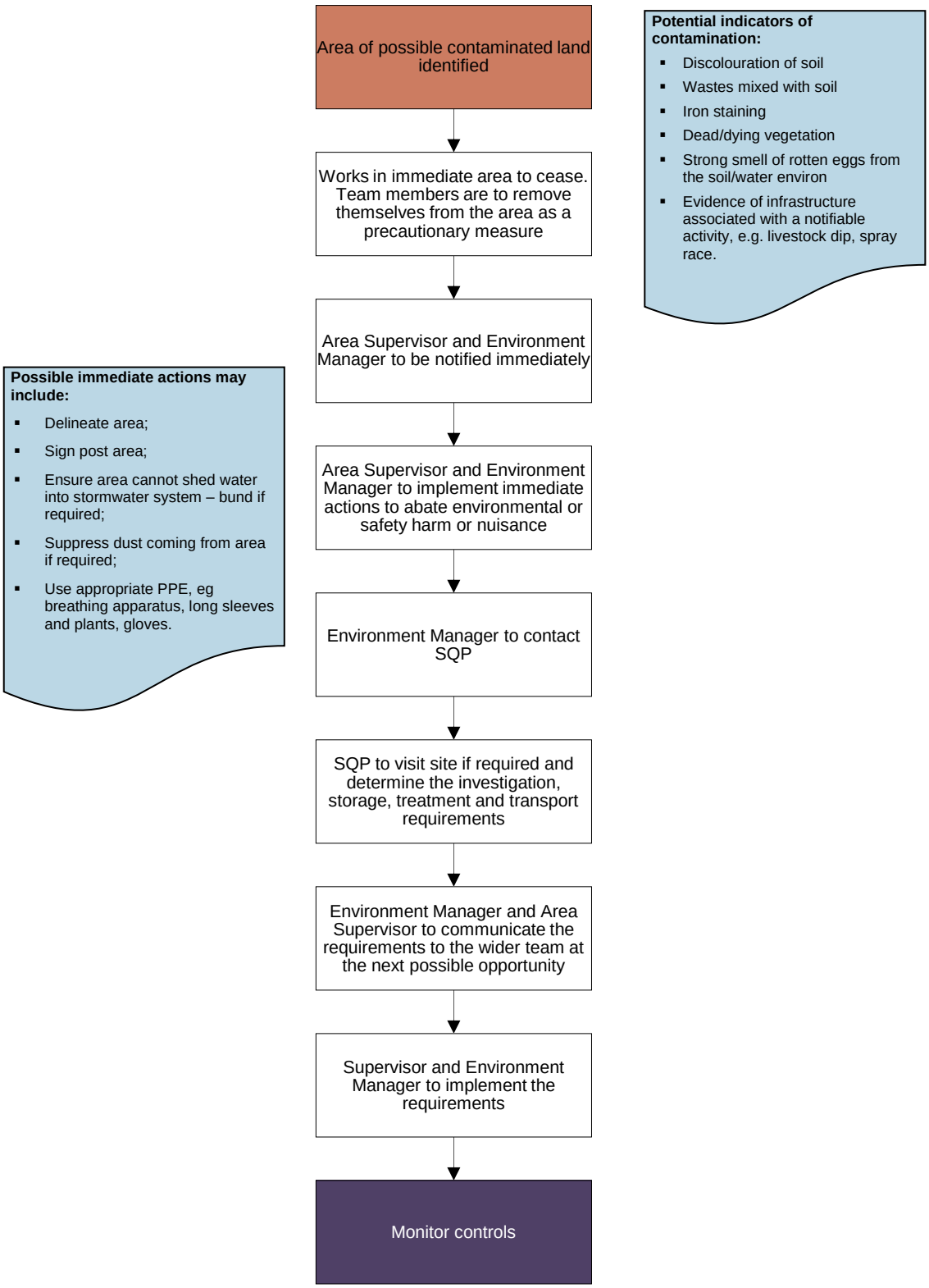
This plan shall be reviewed on a regular basis but not greater than 12 monthly intervals in accordance with the requirements specified in the

- JV Quality Management System requirements
- CEMP Review and

- CopperString 2032, Powerlink – HSE Specification for Contractors and Suppliers, version B.

All the Project environmental management documents, review (version history) will be uploaded and maintained on In Eight or JV's Document Management Systems. The Contaminated land investigation reports undertaken by Douglas Partners Pty Ltd will form an addendum to this management plan.

Appendix A Unexpected Finds Procedure



Appendix B Contaminated land Reports

Reports to be appended to the management plan

Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on an Environmental Site Investigation (Contamination) Proposed Campsites and Substations

CopperString 2.0 Project
Woodstock to Mt Isa, Various

Prepared for
CPB Contractors Pty Ltd

Project 200446.02
March 2024



Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

Project No.	200446.02	Document No.	R.003.Rev0
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Site address	Woodstock to Mt Isa, Various		
Report prepared for	CPB Contractors Pty Ltd		
File name	200466.02.R.003.Rev0. CopperString 2.0		

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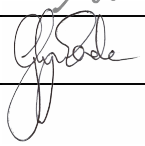
Revision 0	1	0	Mr Graham Tom, CPB Contractors Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.

	Signature	Date
Author		6 March 2024
Reviewer		6 March 2024

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Report on an Environmental Site Investigation (Contamination) Proposed Campsites and Substations

CopperString 2.0 Project

Woodstock to Mt Isa, Various

1. Introduction

Douglas Partners Pty Ltd (Douglas) has been engaged by CPB Contractors Pty Ltd (CPB) to complete this environmental site investigation (contamination) (ESI) for the proposed campsites and substations as part of the CopperString 2.0 Project, which comprises the construction of transmission lines between Woodstock to Mount Isa (hereinafter referred to as 'the Project'). The project site location for the substations and campsites are shown on Drawings 1 to 3 provided in Appendix B.

A site history desktop review and previous site investigations at the site have been reported in Douglas's Report on Preliminary Site Investigation for Contamination CopperString 2.0 Project, 200446.02.R.001.Rev0 dated 12 October 2023 (Douglas, 2023). The field works were conducted in general accordance with Douglas' Sampling Analysis and Quality Pan for the Substation and Camp Sites (SAQP) 200446.02.R.002.Rev1 dated 01 November 2023 (Douglas, 2023a). A copy of the SAQP is provided in Appendix C.

The objective of this ESI is to:

- Investigate the nature and extent of soil contamination, if any, in the proposed construction area footprints of three substations and five campsites;
- establish baseline soil contamination conditions that will serve as the purpose of rehabilitation planning should the site become contaminated during the construction phase (i.e., if the site is deemed contaminated at the decommissioning stage it would be cleaned up/remediated to the estsblished baseline levels); and
- Establish the requirement for remediation, management or if further investigation is necessary to delineate any identified contamination and define the risk before proceeding with construction.

Where relevant the investigation was conducted to a preliminary level in accordance with the NEPC (2013) and is considered a site investigation report in accordance with Sections 387 and 388 of the Environmental Protection Act (1994) (the 'EP Act').

Dr Dawit Bekele (DP Senior Environmental Consultant) is the Suitably Qualified Person (SQP) for the project. Dawit is a member of the Environment Institute of Australia and New Zealand (EIANZ) and is a Certified Site Contamination Specialist (CEnvP-SC).

This report must be read in conjunction with the notes entitled *'About this Report'* provided in Appendix A and other explanatory notes, and the report should be kept in its entirety without separation of individual pages or sections.

1.1 Proposed Development

It is understood that the Project involves the construction and operation of approximately 1,060 km of high voltage overhead electricity transmission line (the 'transmission line alignment') that will extend from Mount Isa to the powerlink transmission network, via a new connection point near Woodstock, south of Townsville. In addition, the project initially included the construction of six substations (i.e., located at Mount Isa, Pentland, Woodstock, Finders 300 and 500, Mulgrave SS, and Dajarra Road) and six supporting temporary campsites (i.e., located at Pentland, Hughenden, Richmond, Julia Creek, Charters Towers and Cloncurry) comprising infrastructure facilities i.e., wastewater treatment areas, concrete batch mixing, offices, car parks, cable drum storage and maintenance areas.

It is understood that due to limited site accessibility and changes in the site investigation scope by the client, the ESI was subsequently carried out at three substations (i.e., Mount Isa, Finders 300 and 500 and Dajarra Road) and five supporting temporary campsites (i.e., Pentland, Hughenden, Richmond, Julia Creek, and Cloncurry)

1.2 Reference Guidelines

The site investigation and report has been prepared with reference to the following guidelines:

- National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended in 2013 (the 'NEPM'), National Environment Protection Council (NEPC);
- Queensland Government (1994) Environmental Protection Act 1994;
- Queensland Department of Environment and Heritage Protection (EHP) (2006) Guideline for contaminated land professionals, Brisbane;
- NSW EPA (2022) Contaminated Land Guideline: Sampling design part 1 – application; and
- NSW EPA Guidelines for Consultants Reporting on Contaminated Land (NSW EPA, 2020).

1.3 Scope of Work

The scope of works was conducted in general accordance with Douglas' SAQP (Douglas, 2023a) (copy provided in Appendix C) and based on correspondence with the client. Field investigations were carried out by Douglas personnel.

The ESI comprised of the following activities:

- Desktop review of the PSI report (Douglas, 2023) to assess the potential for contamination at the site based on the findings of the preliminary Conceptual Site Model (CSM) presented in the PSI;
- A site walkover to establish borehole locations and scanning of each proposed area for services by a certified underground services locator;
- Drilling of six boreholes within each proposed substation area and 12 boreholes per campsite with a mechanical auger drilling rig; and

- Collection of environmental soil samples from test bores at various depth intervals and analysis of selected samples at a National Association of Testing Authorities (NATA) accredited laboratory (further detail is presented in Section 4).

This report was subsequently prepared and discusses:

- A summary of site conditions encountered during the site walkover inspection;
- Soil lithology encountered during intrusive drilling;
- A comparison of soil laboratory results against relevant adopted Tier 1 site assessment criteria (SAC); and
- Recommendations for further investigation, remediation, or specific soil management as appropriate.

2. Site Information

2.1 Site Identification Details

The site identification details are presented in Table 1 and Table 2 below. The project site layout for the substation and campsites are shown on Drawings 1 to 3 provided in (Douglas, 2023).

Table 1: Site Identification Details of the Substations Site Lots Listed on the EMR

Real Property Description	Local Council Areas	Zoning / Surrounding Uses	Current Use	EMR Listing due to Notifiable Activity or Hazardous Contaminant
Lot 422 on SP128451#	Mount Isa City Council (MICC)	Special Industry / Rural	Mine	Abrasive blasting, chemical storage, coal fired power station, petroleum product/oil storage and waste storage/treatment/disposal
Lot 1 DG35	Finders 300 and 500 (FL)	Rural	Vacant Land	NOT included on the EMR and CLR
Lot 521 on CP905413	Dajarra Road (DJR)	Rural	Vacant Land	NOT included on the EMR and CLR

Table 2: Site Identification Details of the Campsite Properties Lots Listed on the EMR

Real Property Description	Local Council Area	Zoning / Surrounding Uses	Current Use	EMR Listing due to Notifiable Activity or Hazardous Contaminant
Lot 35 on GF838293	Pentland	Rural	Vacant land	NOT included on the EMR and CLR
Lot 129 on SP119557	Hughenden	Rural	Vacant land	NOT included on the EMR and CLR

Real Property Description	Local Council Area	Zoning / Surrounding Uses	Current Use	EMR Listing due to Notifiable Activity or Hazardous Contaminant
Lot 69 on SP316362	Hughenden	Rural	Vacant land	NOT included on the EMR and CLR
Lot 221 on SP137115	Richmond	Rural	Vacant land	NOT included on the EMR and CLR
Lot 222 on SP137115	Richmond	Rural	Vacant land	NOT included on the EMR and CLR
Lot 223 on SP137115	Richmond	Rural	Vacant land	NOT included on the EMR and CLR
Lot 224 on SP137115	Richmond	Rural	Vacant land	NOT included on the EMR and CLR
Lot 21 on SP334224	Richmond	Rural / Residential land use to the east, waste facility to the south and vacant land to the north and west.	Vacant land	.The site has been subdivided from Lot 21 on SP334224 which is included on the EMR or the CLR, Gun, pistol, or rifle range
Lot 99 on SP247177	Julia Creek	Rural/ Residential land use to the south and east Vacant land to the north and west	Vacant land	NOT included on the EMR and CLR
Lot 160 on SP166293	Cloncurry	Rural	Vacant land	NOT included on the EMR and CLR

2.2 Listing on Contamination Registers

Based on the desktop review presented in the PSI report (Douglas,2023), Lot 422 on SP128451 (Mount Isa City Council (MICC)) proposed for the construction of substation and Lot 21 on SP334224 (Richmond) proposed for the construction of campsites is currently listed on the EMR. A summary of the listing for each allotment is provided in Table 2 above. A summary of the listing for each allotment is provided in the Douglas (2023) report. The EMR is a database or record maintained by DESI QLD that contains information about environmental concerns, potential contamination, or other relevant data for specific properties or land parcels. It serves as a resource for government agencies, developers, and other stakeholders to make informed decisions about land use, development, and environmental conservation.

3. Previous Information

3.1 Preliminary Site Investigations (Douglas, 2023)

The PSI report includes a desktop investigation of each of the substation and campsite development areas in the form of a desktop site history review together with other relevant sources of information and outlining potential contamination sources and their associated contaminants of potential concern (CoPC) together with potential receptors and transport pathways. This was summarised into a preliminary conceptual site model (CSM) which informed the SAQP (Douglas, 2023a).

3.2 Sampling Analysis and Quality Plan (DP, 2023a)

Following completion of the PSI a SAQP was prepared outlining the limited intrusive soil investigations proposed for the (what was then) six substations (comprising of five allotments) and five campsites (comprising of ten allotments).

The SAQP was prepared for conducting limited site investigation comprising soil assessment for the proposed six substations (comprised of five allotments) and five campsites (comprised of ten allotments). The sampling locations were selected based on the proposed construction plan and findings of the PSI report. The number of sampling locations is considered preliminary and this limitation was discussed with the client, who ultimately selected the adopted sampling density.

4. Field Methodologies

This section relates to Douglas' previously issued SAQP (presented in Appendix C) which was prepared based on the findings of the PSI. Deviations from the proposed SAQP field methodologies are outlined below:

- Due to access restrictions only two soil bores (DJR-BH2-K1 and DJR-BH3-K1) were drilled for environmental sampling at the Dajarra Substation site In addition, the borehole locations were relocated due to a change in the scope of works, as advised by the Client. These relocations were selected whilst minimising the distance between the original and final sampling locations;
- Site investigation at the Chaters Towers campsite was cancelled by the client and no intrusive site investigations were conducted at this location; and
- The client advised that the site investigations proposed at Pentland Substation (Lot 61 on CP905413) and Woodstock and Mulgrave substation (Lot 71 on SP289517) have been postponed and are currently rescheduled to occur in April 2024.

4.1 Summary of Field Methodologies

The field investigations were conducted by a Douglas Environmental Scientist and Engineers between October 2023 and January 2024 over various sampling mobilisation events at the campsites and substations, and comprised of the following activities:

- Soil samples from the topsoil (<0.2m) were collected from selected test bores for analysis of crystalline silica content along transmission lines alignments, substations and the campsites;
- Drilling of a total of 16 bores at the substations (i.e., eight test bores at Flinders substation and six boreholes at both Mt ISA and two test bores Dajarra substation) and drilling of 60 bores at the campsites (i.e., 12 boreholes at the Pentland, Hughenden, Richmond, Julia Creek and Cloncurry Campsites) as part of concurrent geotechnical investigations. The bores were advanced with a mechanical auger drilling rig as discussed in Section 4.2.2;
- Discrete soil samples were collected from boreholes drilled to a depth of 1.5 m bgl at depth intervals of 0.2 m, 0.5 m,1.0 m and 1.5 m. Sampling intervals were changed at some of the locations based on field observations or where apparent signs of potential contamination, i.e., stains or odours, were observed;
- Bores were backfilled with drill spoil material and imported clean sand or quarry gravel (where required);
- Additional sampling for quality control (QC) purposes including intra-laboratory duplicates, trip blanks and trip spike samples. For further details pertaining to Douglas QC procedures, refer to the QC documentation provided in Appendix E; and
- Soil sampling locations were recorded using a dGPS unit to MGA94 Zone 56J reference system and to the Australian Height Datum (AHD).

4.2 Soil Sampling

4.2.1 Sampling Locations

The sampling locations were selected based on a targeted and judgmental sampling strategy informed by the findings of the PSI report, geometry and type of the proposed development within each area. The borehole locations are shown in SAQP (Douglas, 2023a) provided in Appendix C.

4.2.2 Sampling Methodology

To obtain representative samples and to maintain their integrity, environmental soil samples were collected with reference to NEPC (2013), NSW EPA (2022) and standard operating procedures described in Douglas' Field Procedures Manual.

4.2.3 Sample Handling

All samples were recorded on the chain of custody (CoC) sheets, and the general sampling procedure comprised:

- Collection of soil samples directly from the outside of drilling augers i.e., from soil that had not been in direct contact with the augers;
- Surface soil samples from the top 0.2 m were collected in zip lock plastic bag with approximately 500 g of soil sample for crystalline silica content analysis;
- Sampler wearing disposable gloves that was changed prior to the collection of each sample;

- Transfer of samples into laboratory-prepared glass jars with Teflon-lined lids with minimal head spacing and capping immediately;
- Various sampling for QC purposes (refer to Appendix E);
- Labelling of sample containers with individual and unique identification details, including the project number and sample location; and
- Placement of the sample jars into ice-cooled, insulated and sealed containers and transferred to both the primary laboratory Eurofins laboratory (Eurofins) and the secondary laboratory Australian Laboratory Services Pty Ltd (ALS) es .

Sample integrity was maintained by keeping all samples in sealed jars and in ice-cooled, insulated containers immediately after sampling. Samples were sent to the laboratory with ice present within appropriate sample holding times.

It is considered that the integrity of samples was preserved during temporary storage and transportation to the laboratory. CoC and sample receipt documentation is provided in Appendix G.

4.3 Rationale for the Selection of Laboratory Analyses

Primary soil samples were collected and sent to Eurofins mgt at 1/21 Smallwood Place, Murarrie, Brisbane and inter-laboratory duplicate samples was sent to ALS at 2 Byth St, Stafford QLD 4053. Samples were analysed for the following contaminants of potential concern (CoPC) including crystalline silica content, metals/metalloids, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylene (BTEX), polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), organochlorine pesticides (OCP) and phenols.

In addition, trip blank sample and trip spike sample were analysed by Eurofins for QC purposes. Both Eurofins and ALS are accredited by NATA for all analyses undertaken.

4.4 Quality Assurance and Quality Control (QA/QC)

Quality assurance (QA) and QC measures were implemented throughout the investigation and this information is summarised in Appendix E.

5. Field Work Results

5.1 Site Walkover Inspection

DP personnel inspected the site during the soil sample programs between October 2022 to January 2024. The following observations were documented for each specific area.

5.1.1 Substations

Table 3: Site Walkover Observations at the Substations

Substations	Summary of Site Walkover Observation
Mount Isa Substation (Lot 422 on SP128451)	At the time of the investigation, the site comprised of vacant grassland with no apparent active use. A power transmission line was observed crossing the site (Photograph 5). Soil logs from boreholes and surface soils with black stains associated with black ash were observed distributed throughout the site. Black ash was observed to a depth of 1.5 m bgl within borehole MIS-TP11-H1 (Photographs 8 to 10, 12 and 13). Abandoned metal railway sleepers were noticed near the centre of the site (Photographs 11 and 13). Additionally, a gravel-paved driveway was identified at the site (Photograph 14). No obvious signs of distressed vegetation, apparent odours, or potential asbestos-containing materials (PACM) were encountered.
Finders 300 and 500 Substation (Lot 1 on DG35)	At the time of the investigation, the site comprised of vacant grassland with no apparent active use (Photographs 1 to 4). A gravel-paved driveway was identified at the site (Photograph 1). No apparent soil staining, distressed vegetation, apparent odours, or PACM were encountered.
Dajarra Road Substation (Lot 521 on CP905413)	At the time of the investigation, the site was comprised of vacant grassland with no apparent active use (Photograph 1-10). No apparent soil staining, affected vegetation, apparent odours, or PACM were encountered.

5.1.2 Campsites

Table 4: Site Walkover Observations at the Campsites

Campsites	Summary of Site Walkover Observation
Pentland Campsite (Lot 35 on GF838294)	The site was identified as vacant grassland comprised of vacant grassland with no apparent active use (Photographs 1 to 6). No apparent soil staining, affected vegetation, apparent odours, or PACM were encountered during the investigation.
Hughenden Campsite (Lot 129 on SP119557 and Lot 69 on SP316362)	At the time of the investigation, the site was identified as vacant grassland comprised of vacant grassland with no apparent active use (Photographs 1 to 6). A railway line was observed north of borehole HUG1 - BH11 and a surface water drainage culvert was noted underneath the rail runoff flowing towards the site (Photograph 5). An empty abandoned above-ground water storage tank (AST) was noticed west of borehole HUG1 - BH2, and the tank was used for on-site farming activities (Photograph 2). No obvious soil staining, affected vegetation, evidence of fires, apparent odours, or PACM were encountered during the investigation.
Richmond Campsite (Lot 21 on SP334224, and Lots 221 to Lot 224 on SP137115)	The site was Used by council for the storage of construction materials and imported quarry and excavated used asphalt pavement material (Photographs 1, 2 11 and 12). An asphalt-sealed and gravel-paved driveway was observed at the site (Photographs 3 and 6). The site serves as a storage facility including imported construction demolition waste shipping containers, metal scraps and used tyres (Photographs 3, 5, 8, 9, 11, and 12). A sewer line manhole was also noted at the site (Photograph 10). No obvious soil staining, affected vegetation, evidence of fires, apparent odours, or PACM were encountered.
Julia Creek Campsite (Lot 99 on SP247177)	The site was identified as vacant grassland and not in use (Photographs 1 to 6). No apparent soil staining, affected vegetation, evidence of fires, apparent odours, or PACM were encountered.
Cloncurry Campsite (Lot 160 on SP166293)	The site was vacant grassland, with some areas exposing soils, and the site was not in use (Photographs 1 to 6). A gravel-paved driveway was observed at the site (Photograph 1). No obvious soil staining, affected vegetation, evidence of fires, apparent odours, or PACM were encountered.

5.2 Ground Conditions

Details of the subsurface conditions encountered in the boreholes are given on the borehole logs provided in Appendix F. The logs should be read in conjunction with the notes 'About this Report' and other explanatory notes provided in Appendix A, which comment on the sampling methods, soil descriptions, and symbols and abbreviations used in their preparation.

The detailed descriptions of subsurface conditions encountered at the substations and campsites are presented in the geotechnical investigation report (Douglas, 2023b).

No free groundwater was encountered within the boreholes to the maximum depth of 1.5 m bgl at all substation sites and campsites. It should be noted that groundwater depths and ground moisture conditions are affected by climatic conditions and soil permeability and will therefore vary spatially and with time.

6. Site Assessment Criteria

The adopted site assessment criteria (SAC) applied in this investigation comprised of the relevant federal and state government regulations and guidelines outlined in the following sections. Laboratory results are assessed (as a Tier 1 assessment) against the relevant thresholds investigation and screening levels of Schedule B1 of the NEPM (NEPC, 2013). NEPC (2013) is endorsed by the DESI under the National Environment Protection Council Act 1994. A summary of the results is attached in Appendix H.

The NEPM guidelines are applicable to generic land use settings and include consideration of the soil type and depth of parameters for some analytes. They are broadly divided into two groups, health-based investigation or screening levels (HIL/HSLs) representing risks to human receptors, and ecological investigation or screening levels (EIL/ESLs) representing risks to ecological and/or environmental receptors. Investigation or screening levels are not intended to be used as clean-up levels; rather, they establish concentrations above which further investigation should be conducted. They are intentionally conservative and are based on a reasonable worst-case scenario.

6.1 Substations

The adopted SAC proposed for the Project were derived from NEPM (2013) Health Investigation Levels (HILs), Health Screening Levels (HSLs) and Ecological Investigation (EILs) and Ecological Screening Levels (ESLs) for a 'commercial/industrial' exposure scenario.

6.2 Campsites

The adopted SAC comprise the following health-based investigation, screening and/or management levels for low-density residential land use:

- HILs and HSLs for a low-density residential land use scenario (HIL/HSL A).
    - These criteria were adopted as a conservative measure to establish the presence/absence of contamination. They are applicable to residential land uses with gardens/accessible soil, and also to sensitive land uses such as childcare centres, preschools and primary schools.
- HILs and HSLs for public open space (including footpaths) land use scenario (HIL/HSL-C).
    - These criteria are applicable to the current and proposed continued site use.
- EILs and ESLs for an urban residential and public open space land use scenario.

The laboratory results were compared against these thresholds.

6.3 Assessment Criteria for Crystalline Silica

Respirable crystalline silica (RCS) is produced during various mechanical processes in the workplace, such as crushing, cutting, drilling, grinding, sawing, or polishing of natural stone or silica-containing man-made products. Crystalline silica (CS) is present in materials like sand, stone, concrete, and mortar.

A workplace exposure standard (WES) defines the concentration of an airborne hazardous chemical, like respirable crystalline silica, within a worker's breathing zone that should not result in adverse health effects or undue harm. The WES for RCS is set at 0.05 mg/m^3 (eight-hour time-weighted average or TWA).

Although direct air monitoring of RCS was not conducted as part of this investigation, the potential for RCS exposure was evaluated based on the soil crystalline mineral content, considering the risk of silica dust during earthworks and dust generated by vehicle movement on site.

The CS content is indirectly used to recommend if there is a need for air monitoring or to implement control measures to minimise workers' exposure to RCS.

7. Laboratory Analytical Results and Discussion

Laboratory analytical reports and chain of custody documentation are provided in Appendix G. The results are summarised and compared against the adopted SAC in the tables presented in Appendix H, and a discussion of the results is provided below.

7.1 Substations

7.1.1 Mount Isa Substation (Lot 422 on SP128451)

- The concentrations of all CoPC analysed were below the adopted HIL/HSL-C SAC;
- Compared to the adopted EIL/ESL SAC:
  - Zinc in sample MIS-TP15/0.2 was detected at a concentration of 910 mg/kg, exceeding the adopted EIL criteria of 190 mg/kg; and
  - Copper in sample MIS-BH5/0.3 was detected at a concentration of 83 mg/kg, slightly exceeding the adopted EIL criterion of 70 mg/kg.
- No asbestos was detected in all soil samples analysed and no obvious PACM was encountered during this intrusive site investigation; and
- Crystalline Silica (Quartz) content was analysed in two topsoil samples from the surface soil, namely MISTP15-H1 and MISTP9-H1, and identified 23% and 39% of Quartz content by weight respectively.

7.1.2 Finders 300 and 500 Substation (Lot 1 on DG35)

- The concentrations of all CoPC analysed were below the adopted HIL/HSL-C and EIL/ESL SAC;
- No asbestos was detected in all soil samples analysed and no obvious PACM was encountered during this intrusive site investigation; and
- Crystalline Silica (Quartz) content was analysed in two soil samples from the surface soil, namely FLR330_BH16_H2 and FLR330_TP6_H2, and identified 16% of Quartz content by weight in both samples.

7.1.3 Dajarra Road Substation (Lot 521 on CP905413)

- The reported concentrations of all CoPC analysed were below the adopted HIL/HSL-C SAC;
- Compared to the adopted EIL/ESL, copper was detected in two samples DJR-BH2-K1 (93 mg/kg) and DJR-BH3-K1 (75 mg/kg), slightly exceeding the adopted EIL criteria of 70 mg/kg.
- No asbestos was detected in all soil samples analysed and no obvious PACM was encountered this intrusive site investigation; and
- Crystalline Silica (Quartz) content was analysed in two topsoil samples from the surface soil, namely DJR-BH2-K1 and DJR-BH3-K1, and identified 16% and 7% of Quartz content by weight respectively.

7.2 Campsites

7.2.1 Pentland Campsite (Lot 35 on GF838294)

The analytical results indicated the following exceedances of the adopted SAC:

- The reported concentrations of all CoPC analysed were below the adopted HIL/HSL-A SAC except for chromium. Chromium was detected in sample PEN-BH9/0.2 at a concentration of 110 mg/kg which slightly exceeds the adopted HIL-A criterion of 100 mg/kg. However, it should be noted that the criterion of 100 mg/kg is for hexavalent chromium (Cr(IV)) and the concentrations reported by the laboratory are for total chromium. A hexavalent chromium assessment was conducted on PEN-BH9/0.2 samples and has not detected above the laboratory limits of reporting (LOR). As such these chromium exceedances are not considered to represent contamination. No other analysed CoPC were present in concentrations above the adopted HIL/HSL-A criteria in the samples analysed.
- Compared to the HIL/HSL-C, all CoPC analysed were below these criteria in the samples analysed.
- No CoPC were present in concentrations above the adopted EIL/ESL criteria in the samples analysed.
- No asbestos was detected in all soil samples analysed and no obvious PACM was encountered during intrusive site investigations.
- Crystalline Silica (Quartz) content was analysed in two topsoil samples, namely PEN-BH3 and PEN-BH11, and identified 65% and 41% of Quartz content by weight respectively.

7.2.1 Hughenden Campsite (Lot 129 on SP119557 and Lot 69 on SP316362)

- The reported concentrations of all CoPC analysed were below the adopted HIL/HSL-A and HIL/HSL – C SAC;
- The following samples reported concentrations of metals/metalloids that exceeded the adopted EIL SAC for an urban residential and public open space land use scenario:
  - the concentration of copper in samples Hug1-BH1/0-0.2 (110 mg/kg), Hug2-BH12/0-0.2 2/0.5 (80mg/kg), and Hug1-BH2/0.3-0.5 (68 mg/kg), exceeded the adopted criterion of 50 mg/kg;
  - exceedances of nickel were detected above the adopted criterion of 35 mg/kg in seven out of fifteen samples ranging between 40 mg/kg to 81mg/kg; and
  - exceedances of zinc were detected above the adopted criterion of 150 mg/kg in three samples, namely Hug2-BH5/0-0.2 (170 mg/kg), Hug2-BH6/0-0.2 (190 mg/kg) and Hug2-BH12/0-0.2 (250 mg/kg).
- No asbestos was detected in all soil samples analysed and no obvious PACM was encountered during this intrusive site investigation.
- Crystalline Silica (Quartz) content was analysed in two topsoil samples, namely Hug2 – BH5 and Hug2 – BH12, and identified 21% and 14% Quartz content by weight respectively.

7.2.2 Richmond Campsite (Lot 221 and Lot 222 on SP137115 and Lot 21 on SP334224)

- The reported concentrations of all CoPC analysed were below the adopted HIL/HSL - A and HIL/HSL – C SAC;
- The following samples reported concentrations of metals/metalloids that exceeded the adopted EIL SAC for an urban residential and public open space land use scenario:
  - the concentration of copper in sample RIC-BH12/0.5 (67mg/kg) exceeded the adopted criterion of 50 mg/kg;
  - an exceedance of nickel was reported above the adopted criterion of 35 mg/kg in sample RIC - BH12/0.5 (62 mg/kg); and
  - an exceedance of zinc was reported above the adopted criterion of 150 mg/kg in sample RIC - BH12/0.5 (280 mg/kg).
- No asbestos was detected in all soil samples analysed and no obvious PACM was encountered during this intrusive site investigation.
- Crystalline Silica (Quartz) content was analysed in two topsoil samples, namely RIC-BH7 and RIC-BH10, and identified 20% and 16% Quartz content by weight respectively.

7.2.3 Julia Creek Campsite (Lot 99 on SP247177)

- The reported concentrations of all CoPC analysed were below the adopted SAC;
- No asbestos was detected in all soil samples analysed and no obvious PACM was encountered during this intrusive site investigation; and

- Crystalline Silica (Quartz) content was analysed in two soil samples from the surface soil namely, JUL-BH3 and JUL-BH8, and identified 32% and 31% of Quartz content by weight respectively.

7.2.4 Cloncurry Campsite (Lot 160 on SP166293)

- The reported concentrations of all CoPC analysed were below the adopted HIL/HSL - A and HIL/HSL – C SAC;
- The following samples reported concentrations of metals/metalloids that exceeded the adopted EIL SAC for an urban residential and public open space land use scenario:
  - the concentration of copper in sample CLO-BH9/ 0.0-0.1 (77 mg/kg) exceeded the adopted criterion of 50 mg/kg; and
  - exceedances of nickel were detected above the adopted criterion of 35 mg/kg in three samples, namely CLO-BH6/ 0.0-0.2 (37 mg/kg), CLO-BH9/ 0.0-0.1 (210 mg/kg) and CLO- BH11/0.5-0.7 (38 mg/kg).
- No other potential contaminants were present in concentrations above the LOR and therefore the adopted SAC;
- No asbestos was detected in all soil samples analysed and no obvious PACM was encountered during intrusive site investigations; and
- Crystalline Silica (Quartz) content was analysed in two topsoil samples, namely CLO-BH3 and CLO-BH10, and identified 11% and 24% Quartz content by weight respectively.

7.3 Data Quality Assurance and Quality Control

The data QA/QC results are included in Appendix E. Based on the results of the field QA and field and laboratory QC, and evaluation against the data quality indicators (DQI) it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

8. Revised Conceptual Site Model from PSI (Douglas, 2023)

8.1 Substations

8.1.1 Potential Contamination Sources (S)

Based on the limited intrusive site investigations, the potential for gross contamination is considered to be low across the proposed substation sites except for the Mount Isa Substation (Lot 422 on SP 128451) within areas investigated. Exceedances of metal concentrations were reported above the adopted EIL SAC. In addition, the field observations during the site walkover inspection and drilling at this site noted degraded soil and black ash extending to a depth of 1.5 m bgl. The number of sampling locations is considered inadequate to fully characterise the site for potential contamination and further soil investigation to establish the extent of ash is recommended.

- S_1: Fill, which may be associated with ash, earthworks, construction and demolition of former buildings located on the site, potential imported ash fill for site levelling, and other on-site activities:
    - Various CoPC and may include metals, TRH, BTEX, and PAH.

8.1.2 Potential Receptors (R)

The following potential human receptors have been identified:

- R_1: Construction and maintenance workers;
- R_2: Future site users following completion of construction; and
- R_3: Adjacent site users.

The following potential environmental receptors have been identified:

- R_4: Environmental areas (e.g. water courses) located in close proximity of the lots;
- R_5: Groundwater and groundwater dependent ecosystems (GDE) close to the lots; and

8.1.3 Potential Pathways (P)

The following potential pathways have been identified:

- P_1: Ingestion and dermal contact;
- P_2: Inhalation of dust;
- P_3: Surface water run-off;
- P_4: Leaching of contaminants and vertical migration into groundwater;
- P_5: Lateral migration of groundwater providing base flow to water bodies; and
- P_6: Contact with terrestrial ecology.

8.1.4 Summary of Potentially Complete Exposure Pathways

A source → pathway → receptor approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways (P_1 to P_6) between the above potential sources (S_1 to S_3) and receptors (R_1 to R_5) are provided below in Table 5.

Table 5: Summary of Potentially Complete Exposure Pathways for Mount Isa Substation Location

Source and CoPC	Transport Pathway	Receptor	Risk Management Action
Lot 422 on SP128451 (Mt Isa Substation)			
S1: Fill – Metals, TRH, BTEX, PAH, PCB, OCP, phenols and asbestos	P1: Ingestion and dermal contact P2: Inhalation of dust P3: Surface water run-off P4: Leaching of contaminants and vertical migration into groundwater P5: Lateral migration of groundwater providing base flow to water bodies P6: Contact with terrestrial ecology	R1: Construction and maintenance workers R2: Future site users following completion of construction R3: Adjacent site users R4: Terrestrial ecology R5: Groundwater and GDE	Further soil investigation is recommended to assess possible contamination associated with ash fills at the substations

8.2 Campsites

8.2.1 Potential Contamination Sources (S)

Based on the desktop study of site history information and limited intrusive site investigations, the potential for contamination is considered low except for the Richmond Campsite.

The Richmond Campsite is currently used as council storage facility including imported construction demolition waste (i.e,, stockpiles of imported quarry material (soil and rock), asphalt pavement material) shipping containers, metal scraps and used tyres which are considered to present a potential contamination risk.

- S_1: Fill, imported construction demolition waste (i.e, stockpiles of imported quarry material (soil and rock), asphalt pavement material) shipping containers, metal scraps and used tyres:
  - Various CoPC and may include metals, TRH, BTEX, PAH, PCB, OCP, phenols and asbestos;

8.2.2 Potential Receptors (R)

The following potential human receptors have been identified:

- R_1: Current site users;
- R_2: Construction and maintenance workers;
- R_3: Future site users following completion of construction; and
- R_4: Adjacent site users.

The following potential environmental receptors have been identified:

- R_5: Environmental areas located in close proximity of the lots;
- R_6: Groundwater and groundwater dependent ecosystems close to the lots; and

8.2.3 Potential Pathways (P)

The following potential pathways have been identified:

- P_1: Ingestion and dermal contact;
- P_2: Inhalation of dust;
- P_3: Surface water run-off;
- P_4: Leaching of contaminants and vertical migration into groundwater;
- P_5: Lateral migration of groundwater providing base flow to water bodies; and
- P_6: Contact with terrestrial ecology.

8.2.4 Summary of Potentially Complete Exposure Pathways

A source → pathway → receptor approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways (P_1 to P_6) between the above potential sources (S_1 to S_3) and receptors (R_1 to R_6) are provided below in Table 5.

Table 6: Summary of Potentially Complete Exposure Pathways for Richmond Campsite Location

Source and CoPC	Transport Pathway	Receptor	Risk Management Action
Richmond Campsite (Lot 221 and Lot 222 on SP137115 and Lot 21 on SP334224)			
S1: Fill - Metals, TRH, BTEX, PAH, PCB, OCP, phenols and asbestos	P1: Ingestion and dermal contact P2: Inhalation of dust P3: Surface water run-off P4: Leaching of contaminants and vertical migration into groundwater P5: Lateral migration of groundwater providing base flow to water bodies P6: Contact with terrestrial ecology	R1: Current site users R2: Construction and maintenance workers R3: Future site users following completion of construction R4: Adjacent site users R5: Terrestrial ecology R6: Groundwater and GDE	Further soil investigation is recommended to assess possible contamination within areas identified as being of potential concern.

9. Conclusions and Recommendations

Based on the preliminary investigation findings, described in this report, the following conclusions and recommendations are made.

9.1 Substation

9.1.1 Finders 300 and 500 Substation and Dajarra Substation

The investigation result did not indicate the presence of soil contamination at concentrations likely to present an unacceptable risk to potential human or ecological receptors. The site investigation was limited in the number of sampling test bores, however, based on the desktop review and results of the limited site investigation no further soil investigation is recommended.

9.1.2 Mount Isa Substation

Based upon the investigation findings, no contaminants of concern in soils were identified above the adopted SAC for a commercial/industrial site use except for exceedances of zinc, and copper above adopted EIL SAC. This was identified as a data gap and further assessment is recommended to address and mitigate potential environmental impacts.

The field observations during site walkover inspection and intrusive site investigation through boreholes and black stains associated with black ash were observed distributed throughout the site. Black ash was observed to a depth of 1.5 m bgl within borehole MIS-TP11-H1. The number of sampling locations is considered inadequate to fully characterise the site for potential contaminations and further soil investigation of the extent of ash is recommended.

9.2 Campsites

Based on the desktop review and results of the limited site investigation, the results did not indicate the presence of soil contamination at concentrations likely to present an unacceptable risk to potential human or ecological receptors except for exceedances of nickel, zinc, and copper above EILs SAC at Hughenden and Cloncurry campsites.

This was identified as a data gap and further investigation is recommended at these campsites to address and mitigate potential environmental impacts. The detections of these metals, specifically copper, and zinc could potentially be reflective of natural background conditions. However, further investigation is required to establish the background concentrations for these metals.

9.2.1 Richmond Campsite

Based upon the preliminary investigation findings, no contaminants of concern in soils were identified above the adopted SAC for a commercial/industrial site use except for exceedances of adopted EILs SAC for nickel, zinc, and copper. This was identified as a data gap and further assessment was recommended to address and mitigate potential environmental impacts.

The field observations during site walkover inspections the site was used as storage facility including imported construction demolition waste (i.e., stockpiles of imported quarry material (soil and rock), asphalt pavement material) shipping containers, metal scraps and used tyres. The number of sampling locations is considered inadequate to fully characterise the site and further soil investigation of the identified area is recommended.

In addition, Lot 21 on SP334224 proposed for the construction of campsites is currently listed on the EMR Notifiable Activity or Hazardous Contaminant (GUN, PISTOL OR RIFLE RANGE - operating a gun, pistol or rifle range). Soil excavated from this lot should be stockpiled and characterised prior to off-site disposal.

9.3 Baseline Risk Assessment of Respirable Crystaline Silica (RCS)

A qualitative baseline risk assessment was conducted in general accordance with the Australian Institute of Occupational Hygienists (AIOH) Simplified Occupational Hygiene Risk Management Strategies, June 2020 (AIOH, 2020). The risk assessment considers potential worker exposure to RCS arising from disturbance of topsoil. The results of the risk assessment, which is based on the likelihood and consequence of exposure and degree of uncertainty, was used to determine an overall Health Risk Rating, along with the general nature / priority of the actions required (e.g., control / mitigation, information gathering, monitoring).

A qualitative baseline risk assessment, which has been reported under separate cover and should be read in conjunction with this report, is provide in Appendix I.

10. Unexpected Finds Protocol (UFP)

Notwithstanding the above conclusions and the data gaps identified from the limited site investigations, some potential may exist for isolated pockets of contamination being present in other parts of the sites not investigated. Therefore, Douglas recommends the preparation and implementation of an Unexpected Finds Protocol (UFP). The UFP should be included in early works/bulk earthworks Environmental Management Plans (or similar) at the site.

Unexpected finds would typically be able to be identified by visual or olfactory indicators and could include:

- Waste materials in fill, including building and demolition waste;
- Fibre cement fragments (e.g., asbestos containing material (ACM));

- Stained fill/soil;
- Odorous soils (e.g., hydrocarbon odours); and/or
- Ash and/or slag.

The following should be implemented in the event of an unexpected find:

- All work in the immediate vicinity should cease and temporary barricades should be erected to isolate the area;
- A suitably qualified contaminated land consultant should be engaged to inspect the find and provide advice on the appropriate course of action; and
- Any actions should be implemented and validated to demonstrate that there are no unacceptable risks to the receptors.

In the event of an unexpected find, a suitably qualified contaminated land consultant should be engaged to inspect the find and provide advice on the appropriate course of action.

11. References

CRC CARE. (2017). *Risk-based Management and Remediation Guidance for Benzo(a)pyrene.* Technical Report no. 39: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

Douglas. (2023). *Report on Preliminary Site Investigation for Contamination CopperString 2.0 Project, 200446.02.R.001.Rev0 dated 12 October 2023.*

Douglas. (2023a). *Sampling Analysis and Quality Pan for the Substation and Camp Sites (SAQP) 200446.02.R.002.Rev1 dated 1 November 2023.*

DP. (2023). *Report on Preliminary Site Investigation for Contamination CopperString 2.0 Project, Report no. 200446.02.R.001.Revo, Date 6 September 2023.*

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land.* Contaminated Land Guidelines: NSW Environment Protection Authority.

NSW EPA. (2022). *Contaminated Sites, Sampling Design Guidelines.* NSW Environment Protection Authority.

QLD Government. (1994). *Environmental Protection Act, Queensland.* Office of Queensland Parliamentary Council.

12. Limitations

Douglas Partners (DP) has prepared this report (or services) for this project at Woodstock to Mt Isa in accordance with DP's proposal dated 13 June 2023 and acceptance received from Mr Ryan Jones dated 25 July 2023. The work was carried out under DP's Conditions of Engagement (or contract No PO 4501749247, dated 25 July 2023). This report is provided for the exclusive use of CPB Contractors Pty Ltd for this project only and for the purposes as described in the report. The Queensland Department of Environment and Science (DES) and the DES-approved Contaminated Land Auditor (CLA) for the site may use this report only to assess the factual data on site contamination obtained at the time of the investigation. Use of the report by DES and CLA is without recourse to DP for any loss or damage. This report must not be used by any other party or relied upon for other projects or purposes on the same or other site. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the (geotechnical / environmental / groundwater) components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Douglas Partners Pty Ltd

Appendix A

About This Report

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Douglas Partners

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- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

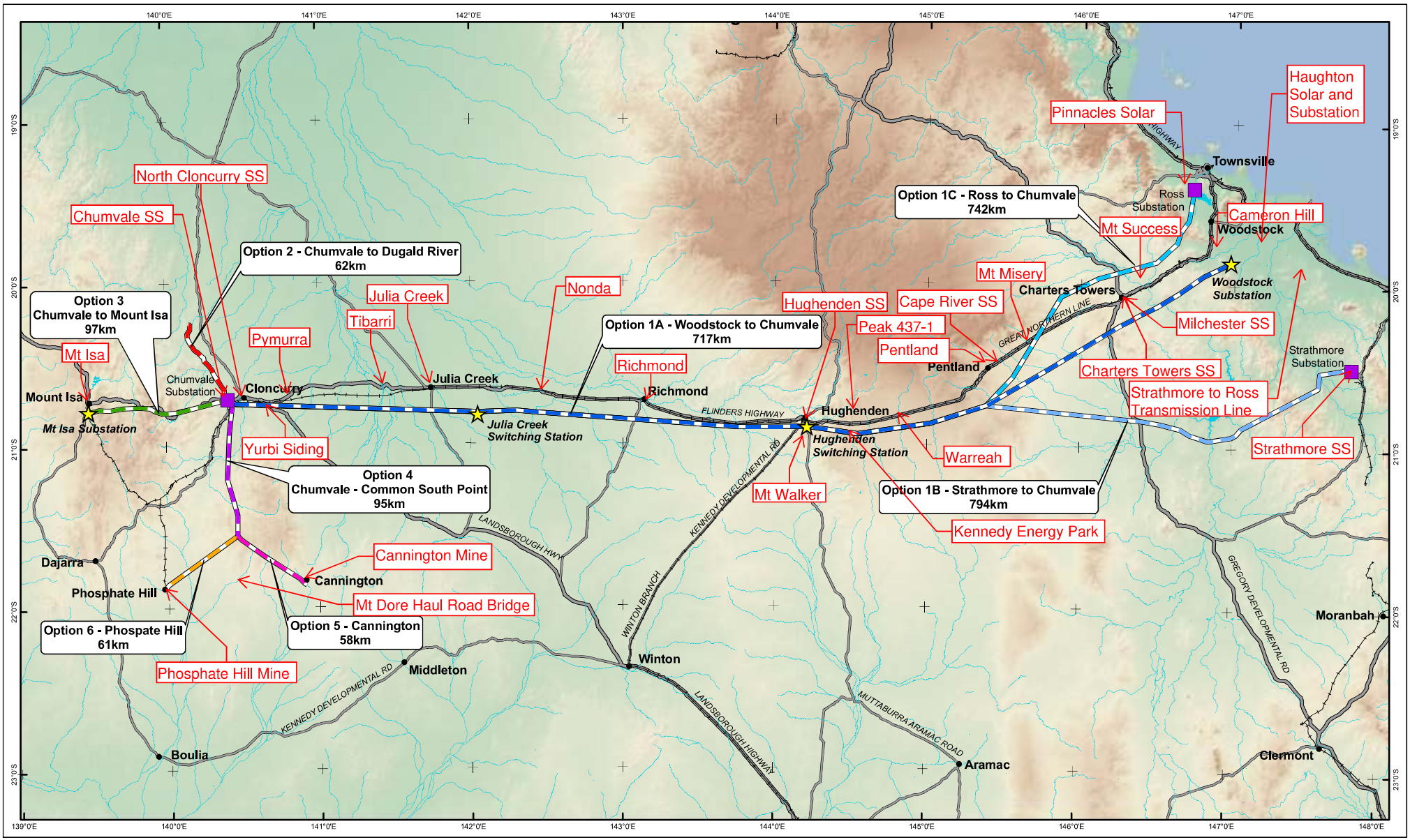
Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Appendix B

Drawings



NOTES

DISCLAIMER
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

LEGEND

Copper String Routes (Rev C)
- Option 1A - Woodstock to Chumvale
- Option 1B - Ross to Chumvale
- Option 1C - Strathmore to Chumvale
- Option 2 - Chumvale to Dugald River
- Option 3 - Chumvale to Mount Isa
- Option 4 - Chumvale - Common South Point
- Option 5 - Cannington
- Option 6 - Phospate Hill

- Proposed Substation Locations
- Existing Substation
- Major Watercourse
- Railway
- Highway
- Secondary Road
- Reservoirs

0 40 80 120 160
Kilometers
Datum: GDA94
Projection: Custom MGA94 Zone 54/55

PROJECT COPPERSTRING TRANSMISSION LINK
TITLE PROJECT STAGES
DATE MAY 2010

Drawing 1

WKSP Z:\clients\HMA_Consulting\08-0004_CuString\Mapping\Workspaces\EIS\Stages.mxd
Created on 18/05/2010 by KR

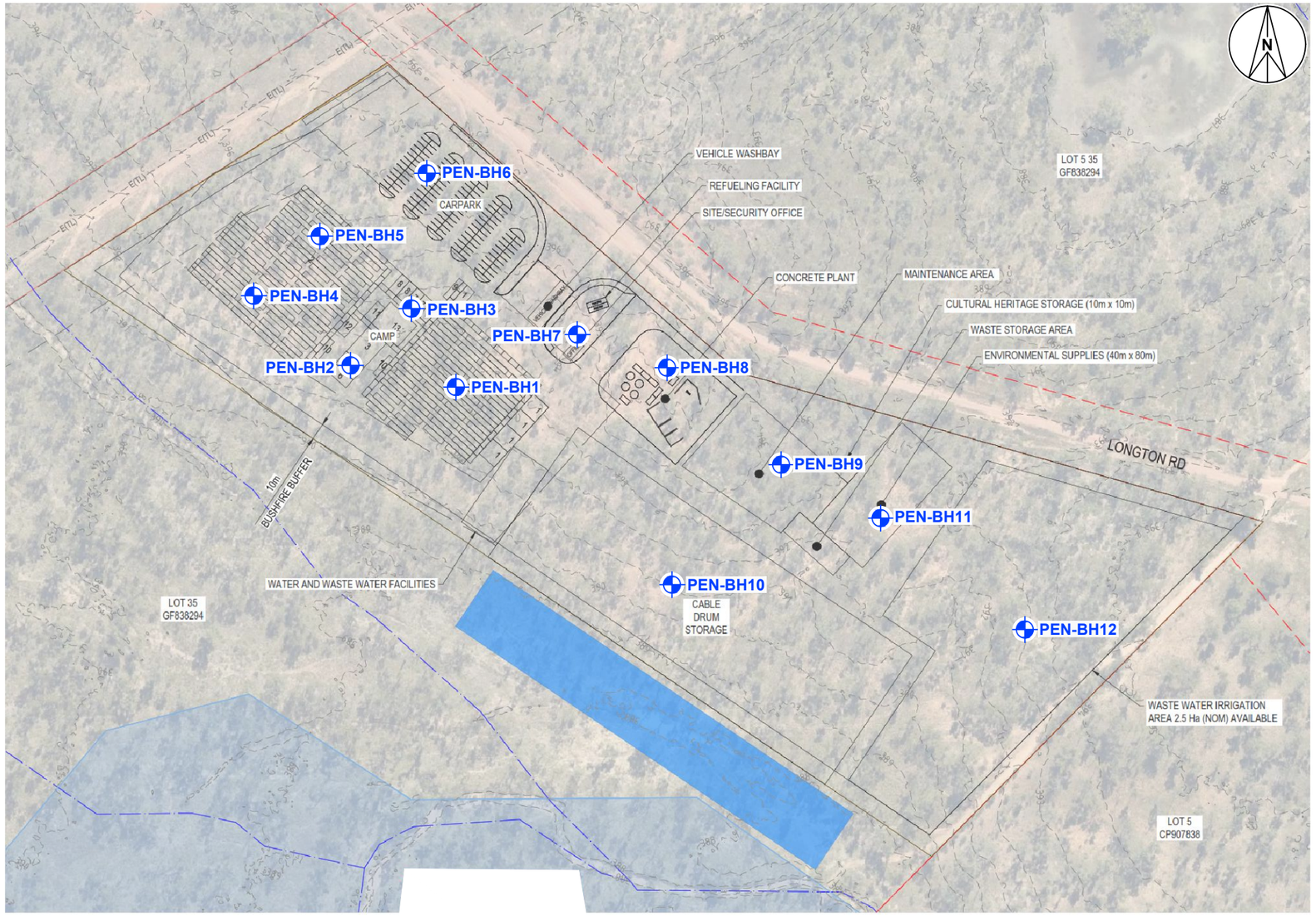
Campsites Environmental Sampling Locations

DCDB CADASTRE

Name	Zone: 55K	
	Easting	Northing
PEN-BH1	334446	7728670
PEN-BH2	334377	7728676
PEN-BH3	334431	7728724
PEN-BH4	334316	7728719
PEN-BH5	334385	7728774
PEN-BH6	334469	7728791
PEN-BH7	334520	7728687
PEN-BH8	334600	7728678
PEN-BH9	334643	7728624
PEN-BH10	334646	7728533
PEN-BH11	334738	7728595
PEN-BH12	334820	7728558

PENTLAND
CAMP REQUIREMENTS (TBC) - 300 PEOPLE

ROOMS:	300 (100 modules)
OFFICE:	1
KITCHEN:	2
FOOD PREP/STORE	3
DINNING:	6
SERVERIES:	1
LAUNDRY:	4
WET MESS:	1
FIRST AID ROOM:	1
GYMS:	3
REC ROOM	2
W/C BLOCK	1



JULIA CREEK USED AND REQUIRED ACQUISITION AREAS

TOTAL 124490m² OF LAND ACQUISITION AREA USED = 100%

TOTAL 10000m² (1.0 Ha) ADDITIONAL LAND ACQUISITION AREA PROPOSED FOR ADDITIONAL WASTEWATER IRRIGATION

TO PROTECT THE ENVIRONMENT, CLEARING SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHALL BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

-WARNING-
BEWARE OF UNDERGROUND SERVICES
THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

LEGEND:-

Borehole Location and Number

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.
2. Plan adapted from drawing No.CU2-HU00-DRG-PAS-100-0002 provided by UGL Pty Limited.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited

OFFICE: Brisbane | DRAWN BY: JST

SCALE: As shown | DATE: 4 October 2023

TITLE: **SITE AND TEST LOCATION PLAN**
COPPERSTRING 2.0 - PROPOSED SUBSTATIONS
PENTLAND - CAMP & LAYDOWN

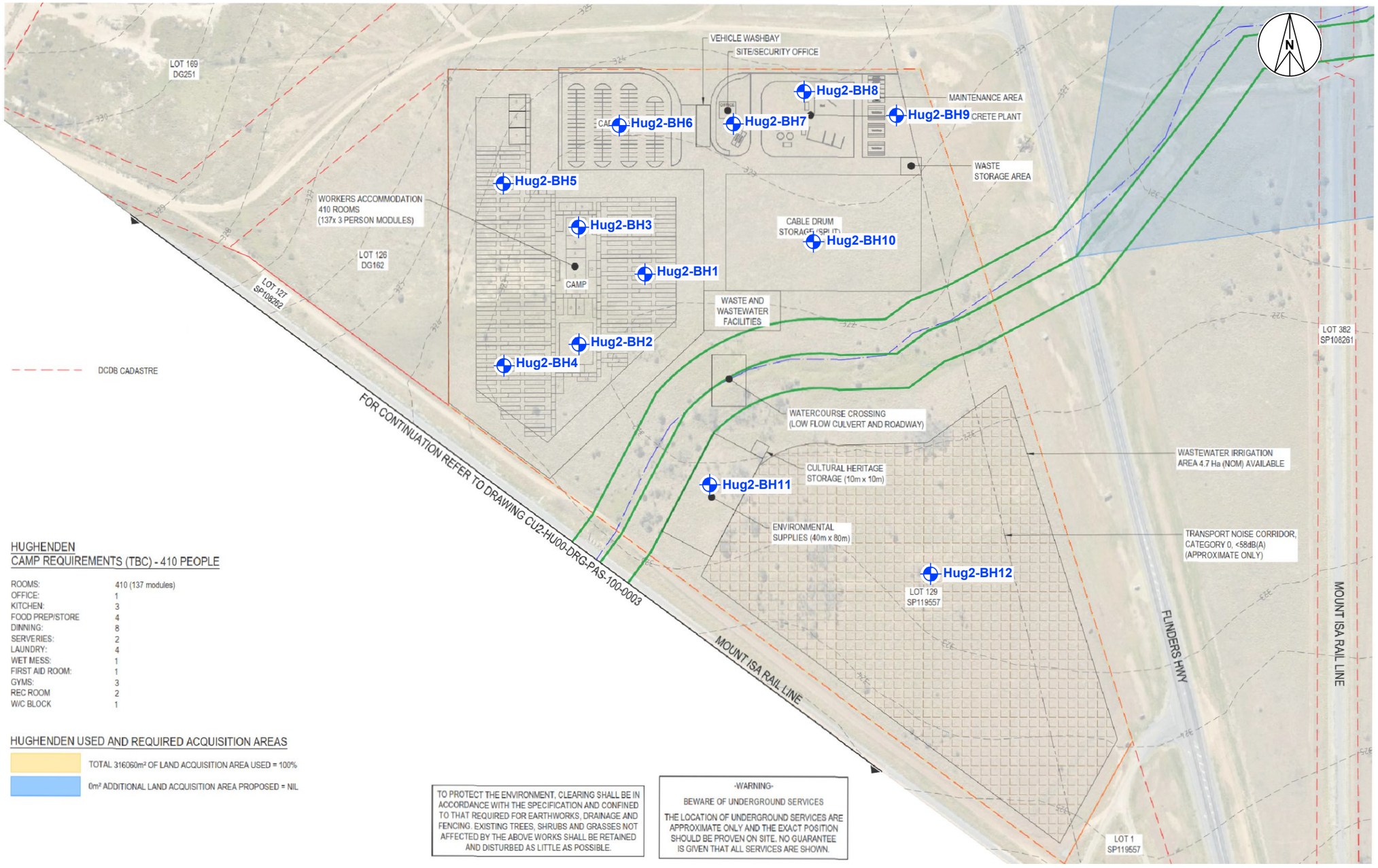
0 20 40 60 80 100
SCALE 1:3,000 (A3)

PROJECT No: 200446.02

DRAWING No: 5

REVISION: 0

P:\200446.02 - WOODSTOCK to MT ISA, Proposed Substation\7.0 Drawings\7.2 Out\PENTLAND - CAMP & LAYDOWN\200446.02.D.005.Rev0. PENTLAND - CAMP & LAYDOWN.dwg



HUGHENDEN
CAMP REQUIREMENTS (TBC) - 410 PEOPLE

ROOMS:	410 (137 modules)
OFFICE:	1
KITCHEN:	3
FOOD PREP/STORE	4
DINNING:	8
SERVERIES:	2
LAUNDRY:	4
WET MESS:	1
FIRST AID ROOM:	1
GYMS:	3
REC ROOM	2
W/C BLOCK	1

HUGHENDEN USED AND REQUIRED ACQUISITION AREAS

TOTAL 316060m² OF LAND ACQUISITION AREA USED = 100%

0m² ADDITIONAL LAND ACQUISITION AREA PROPOSED = NIL

TO PROTECT THE ENVIRONMENT, CLEARING SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHALL BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

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Name	Zone: 55K	
	Easting	Northing
Hug2-BH1	208554	7691021
Hug2-BH2	208502	7690971
Hug2-BH3	208492	7691079
Hug2-BH4	208423	7690968
Hug2-BH5	208419	7691122
Hug2-BH6	208512	7691160
Hug2-BH7	208580	7691138
Hug2-BH8	208649	7691167
Hug2-BH9	208714	7691149
Hug2-BH10	208637	7691077
Hug2-BH11	208576	7690909
Hug2-BH12	208745	7690811

LEGEND:-

Borehole Location and Number

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.
2. Plan adapted from drawing No.CU2-HU00-DRG-PAS-100-0003 provided by UGL Pty Limited.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited

OFFICE: Brisbane | DRAWN BY: JST

SCALE: As shown | DATE: 4 October 2023

TITLE: **SITE AND TEST LOCATION PLAN**
COPPERSTRING 2.0 - PROPOSED SUBSTATIONS
HUGHENDEN - CAMP & LAYDOWN

0 20 40 60 80 100
SCALE 1:3,000 (A3)

PROJECT No: 200446.02

DRAWING No: 3

REVISION: 0

P:\200446.02 - WOODSTOCK to MT ISA, Proposed Substation\7.0 Drawings\7.2 Out\HUGHENDEN - CAMP & LAYDOWN\200446.02.D.001.Rev0. HUGHENDEN - CAMP & LAYDOWN.dwg



Name	Zone: 54K	
	Easting	Northing
RIC-BH1	722229	7706793
RIC-BH2	722157	7706849
RIC-BH3	722215.85	7706878.43
RIC-BH4	722152.1	7706921.1
RIC-BH5	722117.33	7706973.55
RIC-BH6	722079.02	7707031.42
RIC-BH7	722130.64	7706798.28
RIC-BH8	722096.34	7706840.56
RIC-BH9	722046.25	7706916.52
RIC-BH10	722003.79	7706979.23
RIC-BH11	722177.31	7706690.7
RIC-BH12	722189.09	7706626.61

LEGEND:-

Borehole Location and Number

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited		
OFFICE: Brisbane	DRAWN BY: JST	
SCALE: As shown	DATE: 4 October 2023	

TITLE: **SITE AND TEST LOCATION PLAN**
COPPERSTRING 2.0 - PROPOSED SUBSTATIONS
RICHMOND - CAMP & LAYDOWN

0 20 40 60 80 100
SCALE 1:3,000 (A3)

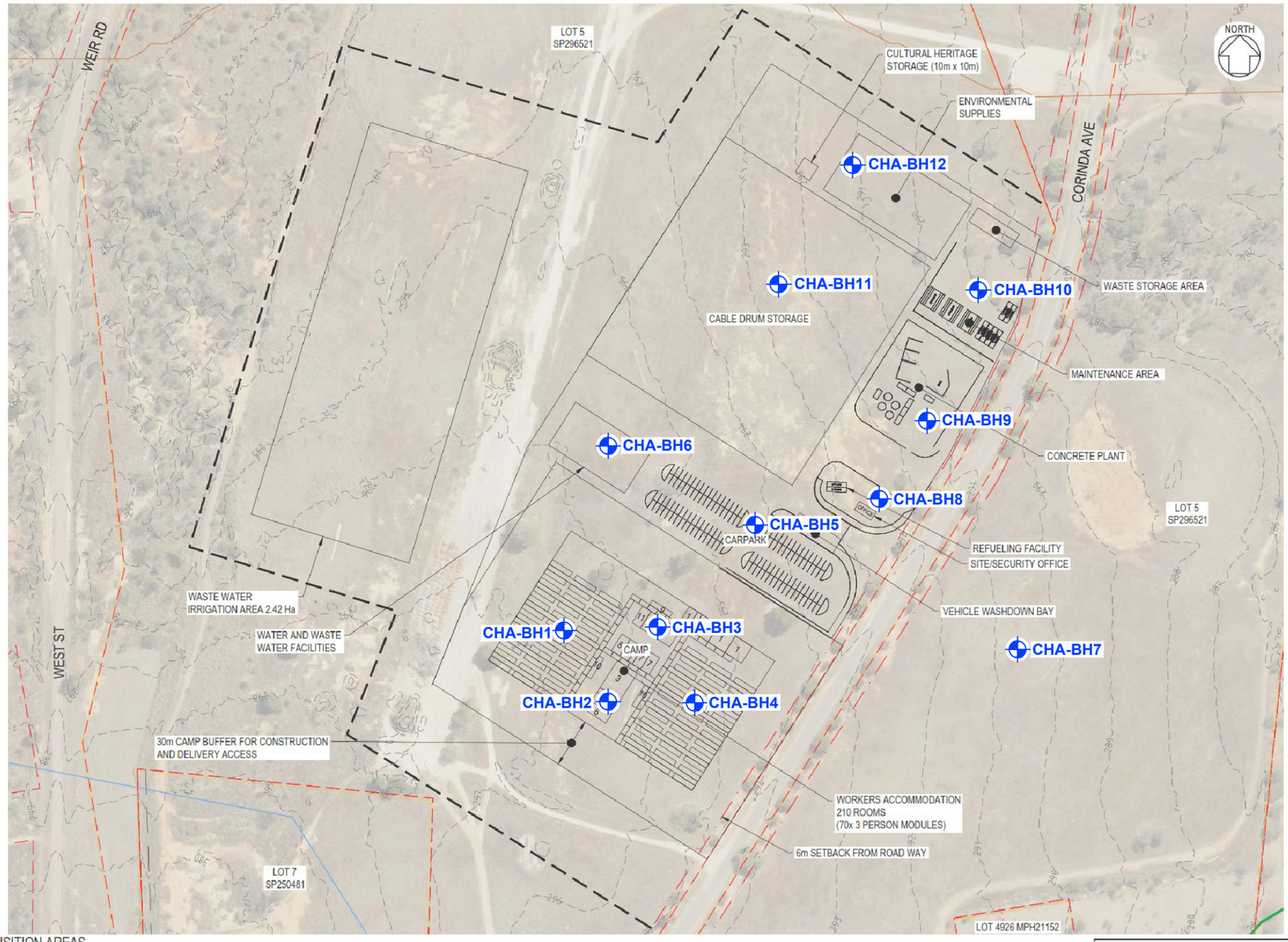
PROJECT No:	200446.02
DRAWING No:	6
REVISION:	0

P:\200446.02 - WOODSTOCK to MT ISA, Proposed Substation\7.0 Drawings\7.2 Out\RICHMOND - CAMP & LAYDOWN\200446.02.D.006.Rev0. RICHMOND - CAMP & LAYDOWN.dwg

DCDB CADASTRE

CHARTERS TOWERS
CAMP REQUIREMENTS (TBC) - 210 PEOPLE

ROOMS:	210 (70 modules)
OFFICE:	1
KITCHEN:	2
FOOD PREP/STORE	3
DINNING:	5
SERVERIES:	1
LAUNDRY:	2
WET MESS:	1
FIRST AID ROOM:	1
GYMS:	3
REC ROOM	2
W/C BLOCK	1



CHARTERS TOWERS USED AND REQUIRED ACQUISITION AREAS

TOTAL 173895m² OF LAND ACQUISITION AREA USED = <100%

0m² ADDITIONAL LAND ACQUISITION AREA PROPOSED = NIL

TO PROTECT THE ENVIRONMENT, CLEARING SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHALL BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

-WARNING-

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

Name	Zone: 55K	
	Easting	Northing
CHA-BH1	423370	7782298
CHA-BH2	423398	7782242
CHA-BH3	423426	7782304
CHA-BH4	423451	7782257
CHA-BH5	423472	7782361
CHA-BH6	423385	7782381
CHA-BH7	423616	7782302
CHA-BH8	423538	7782386
CHA-BH9	423550	7782436
CHA-BH10	423620	7782550
CHA-BH11	423501	7782508
CHA-BH12	423511	7782595

LEGEND:-

Borehole Location and Number

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.
2. Plan adapted from drawing No.CU2-CT00-DRG-PAS-100-0002 provided by UGL Pty Limited.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited

OFFICE: Brisbane | DRAWN BY: JST

SCALE: As shown | DATE: 4 October 2023

TITLE: **SITE AND TEST LOCATION PLAN**
COPPERSTRING 2.0 - PROPOSED SUBSTATIONS
CHARTERS TOWERS - CAMP & LAYDOWN

0 20 40 60 80 100
SCALE 1:3,000 (A3)

PROJECT No: 200446.02

DRAWING No: 7

REVISION: 0

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Name	Zone: 54K	
	Easting	Northing
Jul-BH1	576761	7716379
Jul-BH2	576820	7716360
Jul-BH3	576779	7716321
Jul-BH4	576726	7716272
Jul-BH5	576787	7716262
Jul-BH6	576845	7716300
Jul-BH7	576868	7716389
Jul-BH8	576897	7716274
Jul-BH9	576949	7716342
Jul-BH10	577024	7716231
Jul-BH11	576976	7716212
Jul-BH12	576803	7716167

LEGEND:-

Borehole Location and Number

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited		
OFFICE: Brisbane	DRAWN BY: JST	
SCALE: As shown	DATE: 4 October 2023	

TITLE: **SITE AND TEST LOCATION PLAN**
COPPERSTRING 2.0 - PROPOSED SUBSTATIONS
JULIA CREEK - CAMP & LAYDOWN

0 25 50 75 100
SCALE 1: 2,500 (A3)

PROJECT No:	200446.02
DRAWING No:	4
REVISION:	0

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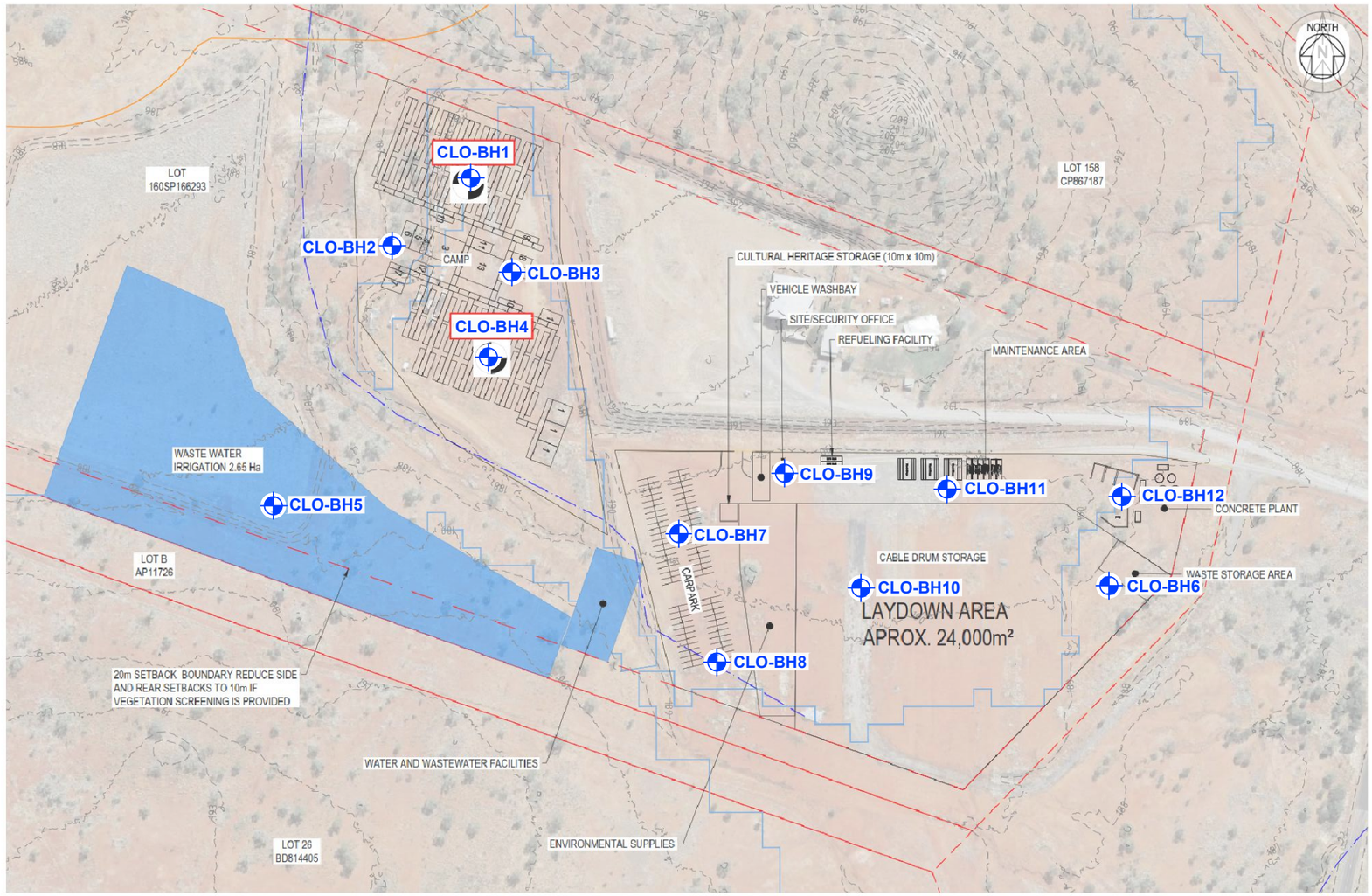
DCDB CADASTRE

CLONCURRY
CAMP REQUIREMENTS (TBC)- 230 PEOPLE

ROOMS:	230 (80 modules)
OFFICE:	1
KITCHEN:	2
FOOD PREP/STORE	3
DINNING:	5
SERVERIES:	1
LAUNDRY:	2
WET MESS:	1
FIRST AID ROOM:	1
GYMS:	3
REC ROOM	2
W/C BLOCK	1



Name	Zone: 54K	
	Easting	Northing
CLO-BH1	445902	7713433
CLO-BH2	445864	7713398
CLO-BH3	445920	7713399
CLO-BH4	445899	7713366
CLO-BH5	445884	7713223
CLO-BH6	446277	7713207
CLO-BH7	446013	7713241
CLO-BH8	446031	7713175
CLO-BH9	446104	7713268
CLO-BH10	446113	7713218
CLO-BH11	446159	7713279
CLO-BH12	446297	7713268

CLONCURRY USED AND REQUIRED ACQUISITION AREAS

TOTAL 77815m² OF LAND ACQUISITION AREA USED = 100%

TOTAL 28000m² (2.8 Ha) ADDITIONAL LAND ACQUISITION AREA PROPOSED:
- WASTEWATER IRRIGATION 26500m² (2.65 Ha)
- WATER STORAGE TANKS AND BORE FACILITIES 1500m² (0.15 Ha)

TO PROTECT THE ENVIRONMENT, CLEARING SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHALL BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

-WARNING-

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

LEGEND:-

Borehole Location and Number

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.
2. Plan adapted from drawing No.CU2-CL00-DRG-PAS-100-0002 provided by UGL Pty Limited.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited

OFFICE: Brisbane | DRAWN BY: JST

SCALE: As shown | DATE: 4 October 2023

TITLE: **SITE AND TEST LOCATION PLAN**
COPPERSTRING 2.0 - PROPOSED SUBSTATIONS
CLONCURRY - CAMP & LAYDOWN

0 20 40 60 80 100
SCALE 1:3,000 (A3)

PROJECT No: 200446.02

DRAWING No: 8

REVISION: 0

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Substations Environmental Sampling Locations



Name	Easting	Northing	Latitude	Longitude
MIS-BH8_H1	342847.087	7702231.82	139.490281	-20.7730766
MIS-BH6_H1	342802.088	7702231.82	139.489849	-20.7730728
MIS-BH19_H1	342786.387	7702108.52	139.489687	-20.7741852
MIS-TP9_H1	342842.238	7702085.15	139.490221	-20.7744011
MIS-TP15_H1	342837.2	7701962.42	139.490162	-20.7755092
MIS-BH27_H1	342786.387	7701990.52	139.489677	-20.7752511

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.

LEGEND:-

- Enviro Test Location and Number
- Geotech Test Location and Number

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited		TITLE: **SITE AND TEST LOCATION PLAN** **COPPERSTRING 2.0 - PROPOSED SUBSTATIONS** **Lot 422 on SP 128451, MOUNT ISA CITY COUNCIL (MIS)**
OFFICE: Brisbane	DRAWN BY: JST	
SCALE: NTS	DATE: 19 September 2023	

PROJECT No: 200446.02
DRAWING No: 1
REVISION: 0

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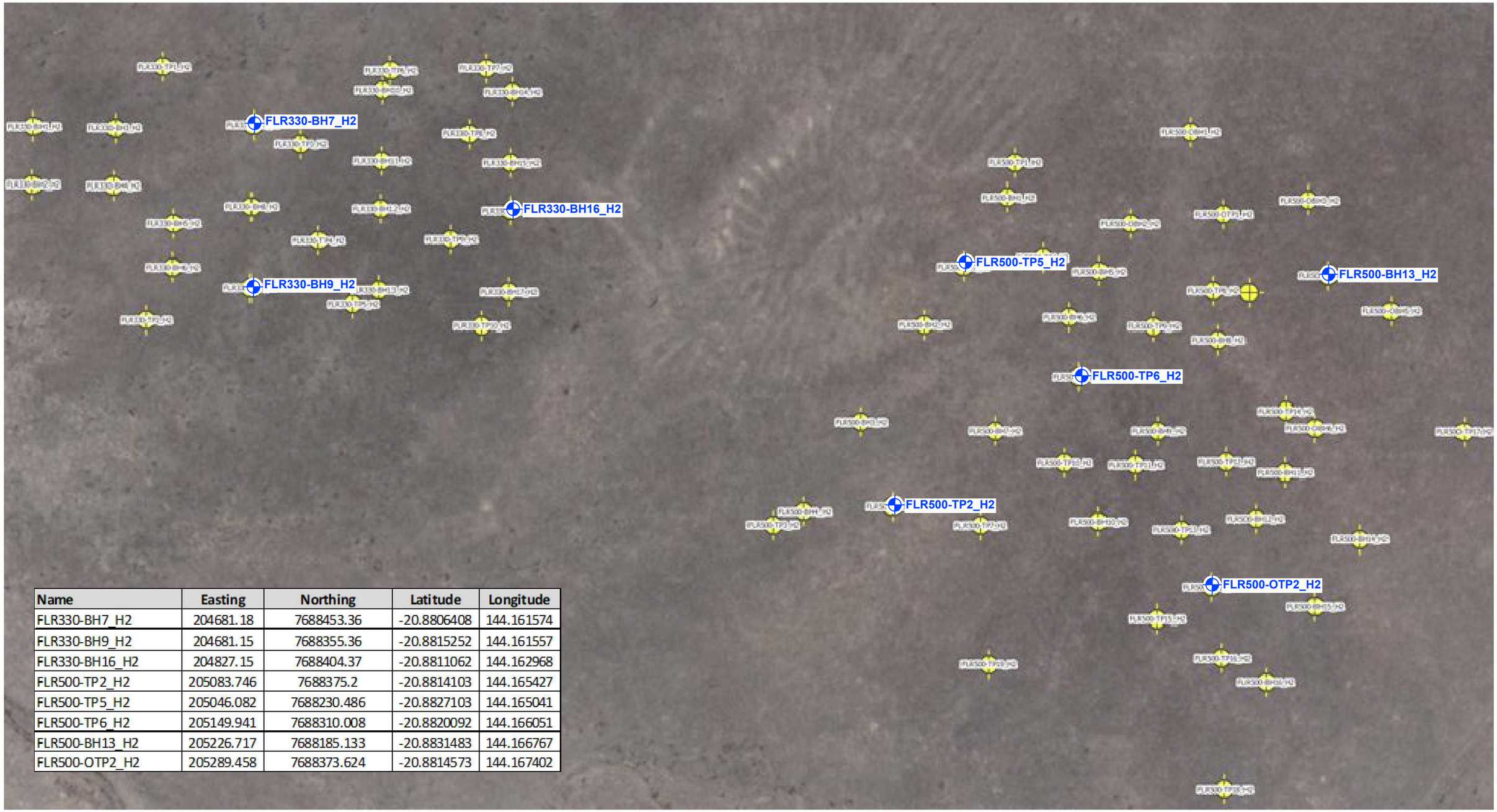

Name	Easting	Northing	Latitude	Longitude
FLR330-BH7_H2	204681.18	7688453.36	-20.8806408	144.161574
FLR330-BH9_H2	204681.15	7688355.36	-20.8815252	144.161557
FLR330-BH16_H2	204827.15	7688404.37	-20.8811062	144.162968
FLR500-TP2_H2	205083.746	7688375.2	-20.8814103	144.165427
FLR500-TP5_H2	205046.082	7688230.486	-20.8827103	144.165041
FLR500-TP6_H2	205149.941	7688310.008	-20.8820092	144.166051
FLR500-BH13_H2	205226.717	7688185.133	-20.8831483	144.166767
FLR500-OTP2_H2	205289.458	7688373.624	-20.8814573	144.167402

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.

LEGEND:-

- Enviro Test Location and Number
- Geotech Test Location and Number

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited		TITLE: **SITE AND TEST LOCATION PLAN** **COPPERSTRING 2.0 - PROPOSED SUBSTATIONS** **Lot 1 DG35, FINDERS 300 & 500 (FL)**
OFFICE: Brisbane	DRAWN BY: JST	
SCALE: NTS	DATE: 20 September 2023	

PROJECT No: 200446.02
DRAWING No: 2
REVISION: 0

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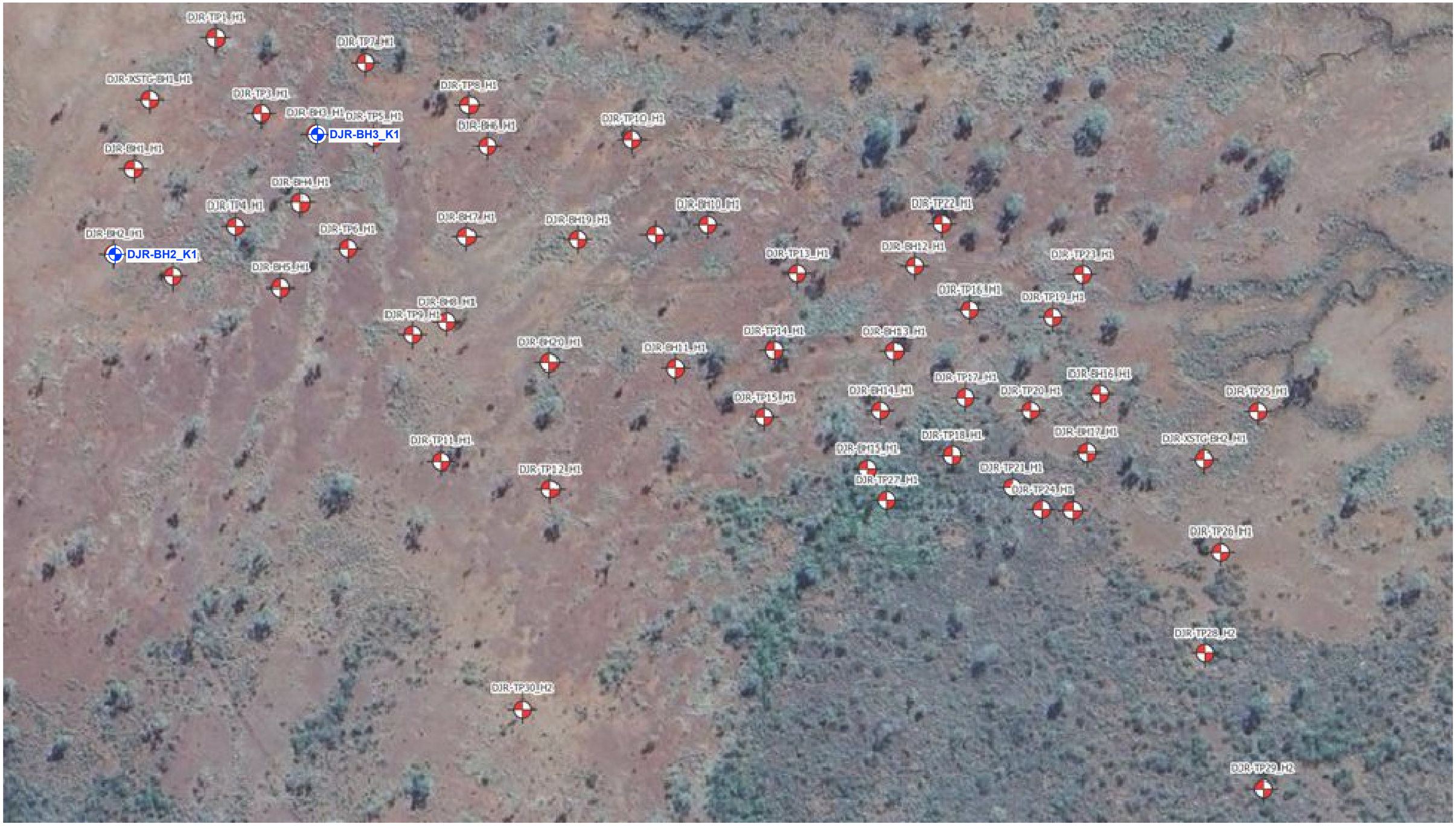

Name	Easting	Northing	Latitude	Longitude
DJR-BH2_K1	437566.593	7706227.17	140.400298	-20.7425657
DJR-BH3_K1	437636.328	7706271.65	140.400969	-20.7421661

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.

LEGEND:-

- Enviro Test Location and Number
- Geotech Test Location and Number

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited		TITLE: **SITE AND TEST LOCATION PLAN**
OFFICE: Brisbane	DRAWN BY: JST	**COPPERSTRING 2.0 - PROPOSED SUBSTATIONS**
SCALE: NTS	DATE: 19 February 2024	**Lot 521 on CP905413, DAJARRA ROAD (DJR)**

PROJECT No: 200446.02
DRAWING No: 4
REVISION: 0

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Appendix C

SAQP

Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Sampling Analysis and Quality Pan for the Substation and Camp Sites

CopperString 2.0 Project
Woodstock to Mt Isa

Prepared for
CPB Contractors Pty Ltd

Project 200446.02
February 2024



Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

Project No.	200446.02	Document No.	R.002.Rev2
Document title	Sampling Analysis and Quality Pan for the Substation and Camp Sites CopperString 2.0 Project		
Site address	Woodstock to Mt Isa		
Report prepared for	CPB Contractors Pty Ltd		
File name	200446.02.R.002.Rev2		

Document status and review

Status	Prepared by	Reviewed by	Date issued
Revision 0	Dr Dawit Bekele	Glyn Eade	12 October 2023
Revision 1	Dr Dawit Bekele	Glyn Eade	1 November 2023
Revision 2	Dr Dawit Bekele	Glyn Eade	15 February 2024

Distribution of copies

Status	Electronic	Paper	Issued to
Revision 0	1	0	Mr Graham Tom, CPB Contractors Pty Ltd
Revision 1	1	0	Mr Graham Tom, CPB Contractors Pty Ltd
Revision 2	1	0	Mr Graham Tom, CPB Contractors Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.

	Signature	Date
Author		15 February 2024
Reviewer		15 February 2024

bsi ISO 9001 Quality Management Systems CERTIFIED
FS 604853

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West End QLD 4101
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Appendix A: About this Report

Appendix B: Drawing Campsites Sampling Locations

Appendix C: Drawing Substations Sampling Locations

Sampling Analysis and Quality Pan for the Substation and Camp Sites
CopperString 2.0 Project
Woodstock to Mt Isa

1. Introduction

Douglas Partners Pty Ltd (DP) has been engaged by CPB Contractors Pty Ltd (CPB) to complete this sampling analysis and quality pan for the substation and camp sites for the proposed CopperString 2.0 Project (hereinafter referred to as 'the Project'). This SAQP is required for the limited site investigation prior to the construction of proposed six substations (comprised of five allotments) and five campsites (comprised of ten allotments) (hereinafter referred to as '*the site'*).

It is understood that the project involves the construction and operation of approximately 1,060 km of extra high voltage overhead electricity transmission line that will extend from Mount Isa to the Powerlink transmission network, via a new connection point near Woodstock, south of Townsville. In addition, the project includes the construction of six substations and six supporting temporary campsites (Pentland, Hughenden, Charters Towers, Richmond, Julia Creek, and Cloncurry) comprising infrastructure facilities i.e., wastewater treatment areas, concrete batch mixing, offices, car park, cable drum storage, maintenance area.

The objective of limited site investigation is to address the data gaps identified in the DP Preliminary Site Investigation (PSI) report (ref: 200446.02.R.001.Rev0.Draft dated 4 October 2023) comprising:

- Investigate the nature and extent of contamination, if any, in the proposed construction areas of six substations and six campsites through a limited assessment of soil within the footprint of the construction areas;
- Evaluate the contamination assessment for the purpose of occupational health risk and establish baseline soil contamination assessment for purpose of rehabilitation planning; and
- Establish the requirement for remediation, management or if further investigation is necessary to delineate any identified contamination and define the risk before proceeding with construction.

This SAQP outlines the methods to be adopted for this assessment and the proposed contamination laboratory testing.

This report must be read in conjunction with the notes entitled *'About this Report'* provided in Appendix A and other explanatory notes, and the report should be kept in its entirety without separation of individual pages or sections.

2. Scope of Works

The following scope of works was completed in general accordance with the scope of services described in our proposal 200466.02 dated 13 June 2023 and comprised:

- Desktop review of the PSI report (DP, 2023) to assess the potential for contamination at the site based on the findings of the preliminary Conceptual Site Model (CSM) presented in the PSI; and
- Preparation of a SAQP informed by the findings of the desktop review outlining:
  - Proposed test locations, sampling depths, and testing parameters such as frequency, and reporting criteria to be adopted;
  - Sampling methods;
  - Laboratory testing program for contaminants of potential concern (CoPC); and
  - Quality assurance / quality control (QA / QC) requirements.

The site identification details are presented in Table 1 and Table 2 below. The project site layout for the substation and campsites are shown on Drawings 1 to 3 presented in DP (2023).

Table 1: Site Identification Details of the Substations Site Lots Listed on the EMR

Real Property Description	Local Council Areas	Zoning / Surrounding Uses	Current Use	EMR Listing due to Notifiable Activity or Hazardous Contaminant
Lot 422 on SP128451[#]	Mount Isa City Council (MICC)	Special Industry / Rural	Mine	Abrasive blasting, chemical storage, coal fired power station, petroleum product/oil storage and waste storage/treatment/disposal
Lot 1 DG35	Finders 300 and 500 (FL)	Rural	Vacant Land	NOT included on the EMR and CLR
Lot 61 GF812272	Pentland (PTL)	Rural	Vacant Land	NOT included on the EMR and CLR
Lot 521 on CP905413	Dajarra Road (DJR)	Rural	Vacant Land	NOT included on the EMR and CLR
Lot 71 on SP289517	Woodstock (WDS)	Rural	Vacant Land	NOT included on the EMR and CLR
	Mulgrave (MLG)	Rural	Vacant Land	NOT included on the EMR and CLR

Note: Woodstock (WDS) and Mulgrave (MLG) substations are located within Lot 71 on SP289517

Table 2: Site Identification Details of the Campsite Properties Lots Listed on the EMR

Real Property Description	Local Council Area	Zoning / Surrounding Uses	Current Use	EMR Listing due to Notifiable Activity or Hazardous Contaminant
Lot 5 on SP296521	Charters Towers	Rural	Vacant land	The site has been subdivided from Lot 5 SP113252 which is included on the EMR or the CLR,

Real Property Description	Local Council Area	Zoning / Surrounding Uses	Current Use	EMR Listing due to Notifiable Activity or Hazardous Contaminant
				Petroleum product or oil storage - storing petroleum products or oil
Lot 35 on GF838293	Pentland	Rural	Vacant land	NOT included on the EMR and CLR
Lot 129 on SP119557	Hughenden	Rural	Vacant land	NOT included on the EMR and CLR
Lot 221 on SP137115	Richmond	Rural	Vacant land	NOT included on the EMR and CLR
Lot 222 on SP137115	Richmond	Rural	Vacant land	NOT included on the EMR and CLR
Lot 223 on SP137115	Richmond	Rural	Vacant land	NOT included on the EMR and CLR
Lot 224 on SP137115	Richmond	Rural	Vacant land	NOT included on the EMR and CLR
Lot 21 on SP334224	Richmond	Rural / Residential land use to the east, waste facility to the south and vacant land to the north and west.	Vacant land	NOT included on the EMR and CLR
Lot 99 on SP247177	Julia Creek	Rural/ Residential land use to the south and east Vacant land to the north and west	Vacant land	The site has been subdivided from Lot 21 on SP334224 which is included on the EMR or the CLR, Gun, pistol, or rifle range.
Lot 160 on SP166293	Cloncurry	Rural	Vacant land	NOT included on the EMR and CLR

2.1 Listing on Contamination Registers

One out of the ten allotments (Lot 35 on GF838293, Pentland) proposed for the construction of campsites is currently listed on the EMR. A summary of the listing for each allotment is provided in Table 2 above. A summary of the listing for each allotment is provided in the DP (2023) report. The EMR is a database or record maintained by DES QLD that contains information about environmental concerns, potential contamination, or other relevant data for specific properties or land parcels. It serves as a resource for government agencies, developers, and other stakeholders to make informed decisions about land use, development, and environmental conservation.

3. Conceptual Site Model

A preliminary CSM was prepared as part of the PSI (DP, 2023). The intrusive site investigation proposed here is to assess baseline contamination status of the allotments within the proposed construction areas of six substations and six campsites through a limited assessment of soil.

4. Sampling ,Analysis and Quality Plan and Methodology

4.1 Reference Guidelines

This SAQP has been prepared with reference to the following guidelines:

- National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended in 2013 (the 'NEPM'), National Environment Protection Council (NEPC).
- Queensland Government (1994) Environmental Protection Act 1994.
- Queensland Department of Environment and Heritage Protection (EHP) (2006) Guideline for contaminated land professionals, Brisbane.
- NSW EPA (2022) Contaminated Land Guideline: Sampling design part 1 - application.

4.2 Data Quality Objectives (DQOs)

Data qualitative objectives (DQOs) are qualitative and quantitative statements that specify the data required for the assessment and have been derived from the relevant guidelines and advice (Section 4.1 of DP (2023) report). The DQO process is a seven-step iterative planning approach that is used to define the type, quantity and quality of data needed to inform decisions relating to the assessment. DQOs are used to ensure the data obtained is sufficient to achieve the objectives of the assessment. DQOs adopted for the assessment of contamination are summarised in Table 3 below.

Table 3: Project DQOs

Problem	Uncertainty exists as to whether soil contamination exist at the sites. Investigation data is required to: • assess the contamination status of each site; • assess the risks posed by the contaminants, if present; and • evaluate additional controls to manage the excess excavated contaminated soils.

Identify the Decision/ Goal	The objectives of the assessment are described in Section 1. The decisions to be made reflect these objectives and are as follows: • Are there any obvious signs of elevated soil contamination within the site? • Does the site, or is the site likely to, present a risk of harm to human health or the environment? • Are there specific controls required for the management of soils containing contaminants which may be exposed or require disposal off-site? • Does the site require further investigation, remediation and/or validation to render the site suitable for the proposed use?
Information Inputs	• Historical information regarding past land uses, activities and features. • Existing relevant environmental data from previous reports; • Site operations and observation details. • Soil profile information was obtained through the sampling phase. • Chemical analysis data for soil samples analysed. • Assessment of analytical data against applicable site assessment criteria (SAC).
Study Boundaries	The physical site boundary for campsites and substations is shown on Appendix B, Drawings 1 to 9 and Appendix C, Drawing 1 to 5 respectively and forms the boundary of this investigation. The temporal boundary of this assessment is limited to the time at which the assessment will be conducted.
Decision Rules	In assessing contamination analytical data against screening levels for ecological and/or human health risk, site conditions can be stated to be acceptable if either: • All results are below the relevant screening level, below the treatment trigger levels; OR • Individual concentrations of analytes (non-volatile) are less than 250% of the relevant screening level; and • The 95% upper confidence limit (UCL) of mean concentrations of a data set for samples of like material is below the relevant screening level; and • The standard deviation of the population is <50% of the relevant screening level. Statistical analysis need only be conducted where analytical results for a contaminant of concern are recorded above, but less than 250% of the relevant screening level. Laboratory results will be accepted and considered suitable for this assessment under the following conditions: • All laboratories used are accredited by the National Association of Testing Authorities (NATA) for all analyses to be performed;

	• All practical quantitation limits (PQLs), or laboratory limits of reporting (LORs) set by the laboratories fall below the adopted assessment criteria; • Reported concentrations of analytes in the replicate and/or split sample pairs are within accepted limits; and • Quality assurance/quality control (QA/QC) protocols and results reported by the laboratories comply with the requirements of the NEPM (Schedule B3).
Performance Criteria	Assessment criteria adopted from the guidelines detailed in Section 5.1 incorporate risk probabilities. Acceptable limits for replicate comparisons are: • Frequency: 5% of primary samples; and • Relative percent difference (RPD): <30%. Acceptable limits for laboratory QA/QC parameters are based on those stated by the laboratory and those stated in the NEPM (Schedule B3).
Optimise design	• Procedures for the collection of environmental samples, as described in Section 5.4, were developed prior to undertaking the assessment phase of works with reference to the NEPC (2013), NSW EPA (2022), and current best industry practice. • NATA accredited analytical laboratories will be used to conduct sample analyses.

4.3 Summary of Field Methodologies

Field investigations will be carried out by Douglas Partners personnel. It is proposed that the investigation will comprise the following activities:

- Drilling of 12 bores (i.e., six boreholes at each substation) drilled as part of concurrent geotechnical investigations with a mechanical drilling rig rationale discussed in Section 5.4.1;
- Drilling of 96 bores (i.e., 12 boreholes at each camp site) drilled with a mechanical drilling rig;
- Additional sampling for quality control (QC) purposes including intra-laboratory duplicates, inter-laboratory duplicates, trip blanks and trip spike samples; and
- Bores to be backfilled with drill spoil material and imported clean soil or quarry gravel (where required).

4.4 Soil Sampling

4.4.1 Number of Samples and Locations

The allotment for the proposed substation and campsites covers significantly large area and relative to the construction areas. In addition, the based on the PSI report the site has been rural land and low to moderate risk of contamination. Consequently, a limited soil investigation at the sites is proposed. The proposed number of sampling locations does not meet the minimum required sampling density as per NSW EPA (2022), required to fully characterise contaminated site.

A combined judgmental (targeted) and systematic sampling strategy has been adopted at the targeted areas of construction areas to establish the sampling locations based on the size, geometry and type of the proposed development within each area.

Substations

The PSI has been used to develop an investigation for the characterisation of soils to be disturbed. The foot print of the substation construction area covers approximately 250 m by 250 m (area of 62,500 m^2). Soil samples will be collected from geotechnical boreholes drilled to a depth of 1.5 m below ground level (bgl) and discrete samples will be collected along the depth to delineate vertical soil contaminations. A summary of the proposed sampling to be conducted within the substation areas is presented in Table 4.

The proposed soil sampling borehole locations are shown on Drawings 1 to 5, provided in Appendix C.

Table 4: Summary of Proposed Sampling Within the Substation Areas

Real Property Description	Local Council Area	Borehole depth (m bgl)	Sampling depth (1)	Number of samples to be analysed
Lot 422 on SP128451:	Mount Isa City Council (MICC)	Soil samples will be collected from geotechnical boreholes that will be drilled up to 1.5 m bgl or prior refusal with a utility mounted drilling rig equipped with a solid flight auger.	Soil samples will be collected at depth intervals of 0.2 m, 0.5 m,1.0 m and 1.5 m from each borehole.	Six
Lot 1 DG35	Finders 300 & 500 (FL)			Eight

Real Property Description	Local Council Area	Borehole depth (m bgl)	Sampling depth (1)	Number of samples to be analysed
Lot 61 GF812272	Pentland (PTL)			Six
Lot 521 on CP905413	Dajarra Road (DJR)			Six
Lot 71 SP289517	Woodstock (WDS)			Six
	Mulgrave (MLG)			Six

Note (1): Sampling intervals may be changed during the field investigation based on observations of potential contamination or different types of fill.

Camp Sites

Soil sampling from 12 boreholes at each camp site is proposed. Six of the 12 bores will be located judgementally targeting the proposed camp area and an additional six bores will be distributed across the remaining areas to provide general coverage of the area or infrastructure facilities i.e., car park, cable drum storage, maintenance area. A summary of proposed sampling methodology within camp site is presented in Table 5 The proposed soil sampling borehole locations are shown on Drawings 3 to 10 attached in Appendix B.

Table 5: Summary of proposed sampling within camp sites

Sampling locations	Borehole depth (m bgl)	Sampling depth	Number of samples to be analysed
Lot 5 on SP296521	Boreholes will be drilled up to 1.5 m bgl, or prior refusal with a utility mounted drilling rig equipped with a solid flight auger.	Soil samples will be collected at depth intervals of 0.2 m, 0.5 m, 1.0 and 1.5 m from each borehole. Sampling intervals may be changed during the field investigation based on observations of	84
Lot 35 on GF838293			
Lot 129 on SP119557 *			
Lot 221 on SP137115			

Sampling locations	Borehole depth (m bgl)	Sampling depth	Number of samples to be analysed
Lot 222 on SP137115		potential contamination or different types of fill.	
Lot 223 on SP137115			
Lot 224 on SP137115			
Lot 21 on SP334224			
Lot 99 on SP247177			
Lot 160 on SP166293			

4.4.2 Sampling Methodology

To obtain representative samples and maintain their integrity, soil contamination samples will be collected with reference to NEPC (2013), NSW EPA (2022) and standard operating procedures described in DP's Field Procedures Manual.

If odours are encountered during sampling, then replicate soil samples will be collected in and screened in the field for volatile organic compounds (VOCs) using a calibrated photoionisation detector (PID).

4.4.3 Sample Handling

All samples will be recorded on DP chain of custody sheets, and the general sampling procedure will comprise:

- Collection of soil samples from the drilling augers. Samples collected from the augers will be obtained from the outside of the augers, i.e., from soil that had not been in direct contact with the augers;
- Sampler wearing disposable gloves that will be changed prior to the collection of each sample;
- Transfer of samples into laboratory-prepared glass jars with Teflon-lined lids with minimal head spacing and capping immediately;
- Various sampling for QC purposes (refer to Section 4.6);
- Labelling of sample containers with individual and unique identification details, including the project number and sample location; and
- Placement of the sample jars into ice-cooled, insulated and sealed containers and transferred to the laboratory (Eurofins and ASL).

Sample integrity will be maintained by keeping all samples in sealed jars and in ice-cooled, insulated containers immediately after sampling. Samples will be either sent to the laboratory with ice present on the same day as sampling or chilled overnight and sent to the laboratory with ice present on the following day.

4.5 Rationale for Selection of Laboratory Analytical Programme

Primary soil samples will be collected and sent to Eurofins mgt at 1 / 21 Smallwood Place, Murarrie, Brisbane and intra-laboratory duplicate samples will be sent to ALS Environmental laboratories at 2 Byth St, Stafford QLD 4053 Samples will be analysed for the following contaminants of potential concern (CoPC) including metals/metalloids, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylene (BTEX), polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), organochlorine pesticides (OCP) and phenols. An additional one soil samples from each site will be analysed for % iron, cation exchange capacity (CEC), pH, total organic carbon (TOC), and % clay content to establish site-specific ecological investigation levels. Primary soil samples will be collected and sent to Eurofins laboratory located at 1/21 Smallwood Place, Murarrie, QLD (Eurofins). Both Eurofins and ALS are accredited by NATA for these analyses.

Any potential asbestos containing material (PACM) encountered during field work will be collected and analysed following consultation with CPB.

Furthermore, additional samples may be recommended for testing if this will improve the delineation of any contaminated strata or areas encountered during drilling. Any additional testing would be recommended based on the results of initial screening and laboratory tests.

4.6 Quality Assurance and Quality Control (QA/QC)

QA and QC measures will be implemented throughout the investigation. This will be achieved through adherence to Douglas Partner's ISO 9001:2015 accredited Quality Management System. QA/QC measures for the contamination assessment will be achieved by evaluating the QA/QC information against the defined DQOs (Table 5) for the project. The proposed field QC sampling programme is summarised in Table 6.

Table 6: Field QC Schedule

Item	Frequency	Acceptance Criteria
Intra-laboratory replicate	5% primary samples (1 in 20)	RPD <30%
Inter-laboratory replicate	5% primary samples (1 in 20)	RPD <30%
Trip Blank	One per field batch	<LOR
Trip Spike	One per field batch	Four times the LOR

Intra-laboratory samples, trip blanks and trip spikes will be analysed by Eurofins for QC purposes. Inter-laboratory samples will be analysed by Australian Laboratory Services Pty Ltd (ALS), at 2 Blyth Street, Stafford, Brisbane for QC purposes. Both laboratories are accredited by NATA for the proposed analyses.

4.7 Sample Disposal

Following the receipt of the contamination results from the laboratory, any samples collected from the site and stored at DP will be disposed of according to appropriate landfill disposal criteria. All contamination soil samples sent to the laboratories are disposed of according to laboratory procedures.

5. Site Assessment Criteria (SAC)

Analytical soil results will be compared against the investigation and screening levels presented in Schedule B1 of the NEPM (NEPC, 2013). NEPC (2013) is endorsed by the DES under the *National Environment Protection Council Act 1994*.

The NEPM guidelines are applicable to generic land use settings and include consideration of the soil type and depth of parameters for some analytes. They are broadly divided into two groups, health-based investigation or screening levels (HIL/HSLs) representing risks to human receptors, and ecological investigation or screening levels (EIL/ESLs) representing risks to ecological and/or environmental receptors. Investigation or screening levels are not intended to be used as clean-up levels; rather, they establish concentrations above which further investigation should be conducted. They are intentionally conservative and are based on a reasonable worst-case scenario.

5.1 Substations

The adopted SAC proposed for the Project were derived from NEPM (2013) Health Investigation Levels (HILs), Health Screening Levels (HSLs) and Ecological Investigation (EILs) and Ecological Screening Levels (ESLs) for a 'commercial/industrial' exposure scenario.

5.2 Campsites

The adopted SAC comprise the following health-based investigation, screening and/or management levels for low-density residential land use:

- HILs and HSLs for a low-density residential land use scenario (HIL/HSL A).
    - These criteria were adopted as a conservative measure to establish the presence/absence of contamination. They are considered to be applicable to residential land uses with gardens/accessible soil, and also to sensitive land uses such as childcare centres, preschools and primary schools.
- HILs and HSLs for public open space (including footpaths) land use scenario (HIL/HSL-C).
    - These criteria are applicable to the current and proposed continued site use.
- EILs and ESLs for an urban residential and public open space land use scenario.

Laboratory results will be compared against these thresholds.

6. Reporting

The results of the assessment will be incorporated into an Environmental contamination assessment report that describes the results of the investigation against the relevant threshold limits. Plans, site photos and other relevant graphics will be included to demonstrate and explain important site or filling features.

7. References

DP. (2023). *Report on Preliminary Site Investigation for Contamination CopperString 2.0 Project, Report no. 200446.02.R.001.Revo, Date 6 September 2023.*

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

NSW EPA. (2022). *Sampling Design, Part 1: Application; Part 2: Interpretation.* NSW Environment Protection Authority.

QLD Government. (1994). *Environmental Protection Act, Queensland.* Office of Queensland Parliamentary Council.

8. Limitations

Douglas Partners (DP) has prepared this report (or services) for this project at Woodstock to Mt Isa in accordance with DP's proposal dated 13 June 2023 and acceptance received from Mr Ryan Jones dated 25 July 2023. The work was carried out under DP's Conditions of Engagement (or contract No PO 4501749247, dated 25 July 2023). This report is provided for the exclusive use of CPB Contractors Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions

across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Douglas Partners Pty Ltd

Appendix A

About this Report

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Douglas Partners

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- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

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- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

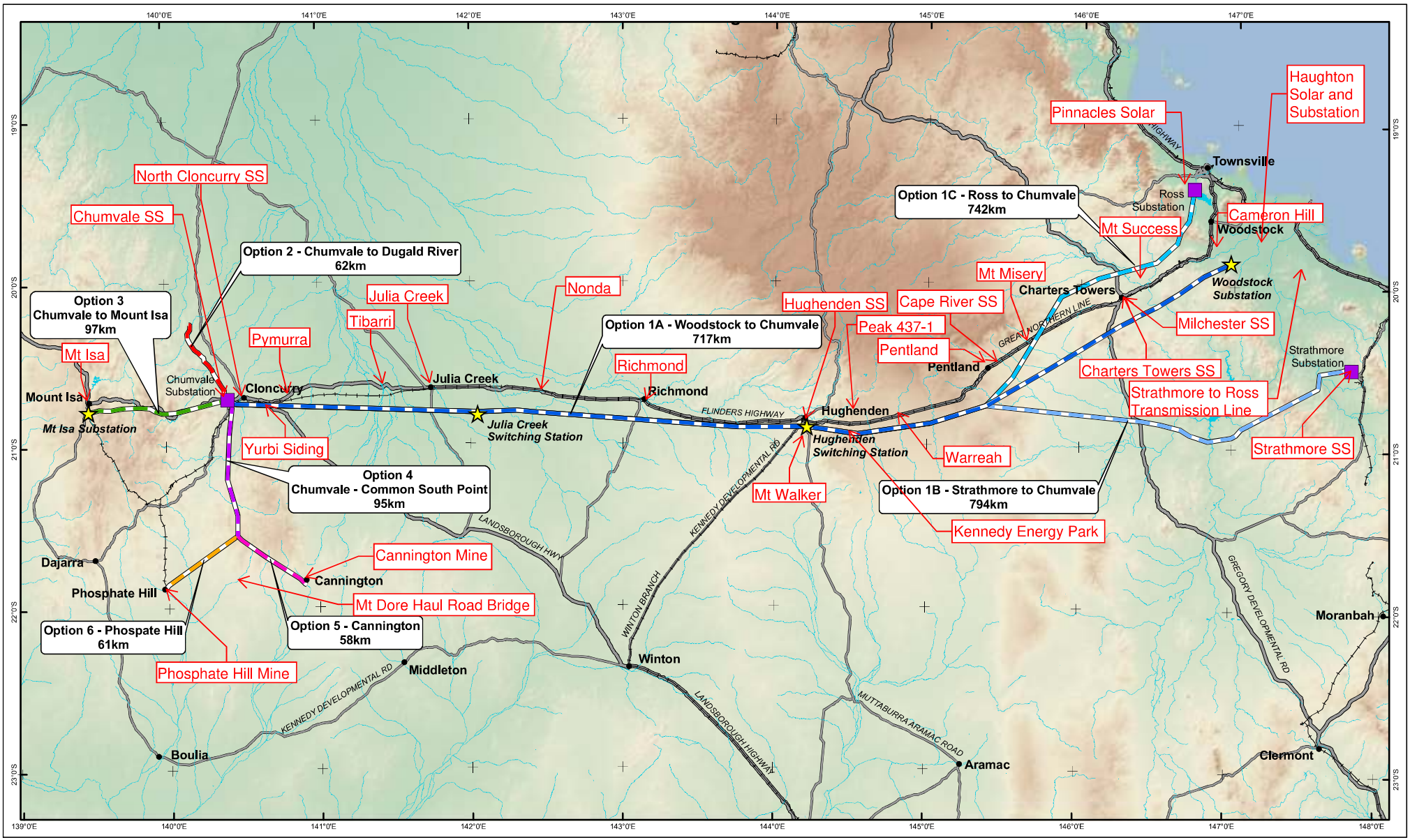
Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Appendix B

Campsites Sampling Locations



NOTES

DISCLAIMER
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

LEGEND

Copper String Routes (Rev C)
- Option 1A - Woodstock to Chumvale
- Option 1B - Ross to Chumvale
- Option 1C - Strathmore to Chumvale
- Option 2 - Chumvale to Dugald River
- Option 3 - Chumvale to Mount Isa
- Option 4 - Chumvale - Common South Point
- Option 5 - Cannington
- Option 6 - Phospate Hill

- Proposed Substation Locations
- Existing Substation
- Major Watercourse
- Railway
- Highway
- Secondary Road
- Reservoirs

0 40 80 120 160
Kilometers
Datum: GDA94
Projection: Custom MGA94 Zone 54/55

PROJECT COPPERSTRING TRANSMISSION LINK
TITLE PROJECT STAGES
DATE MAY 2010

Drawing 1

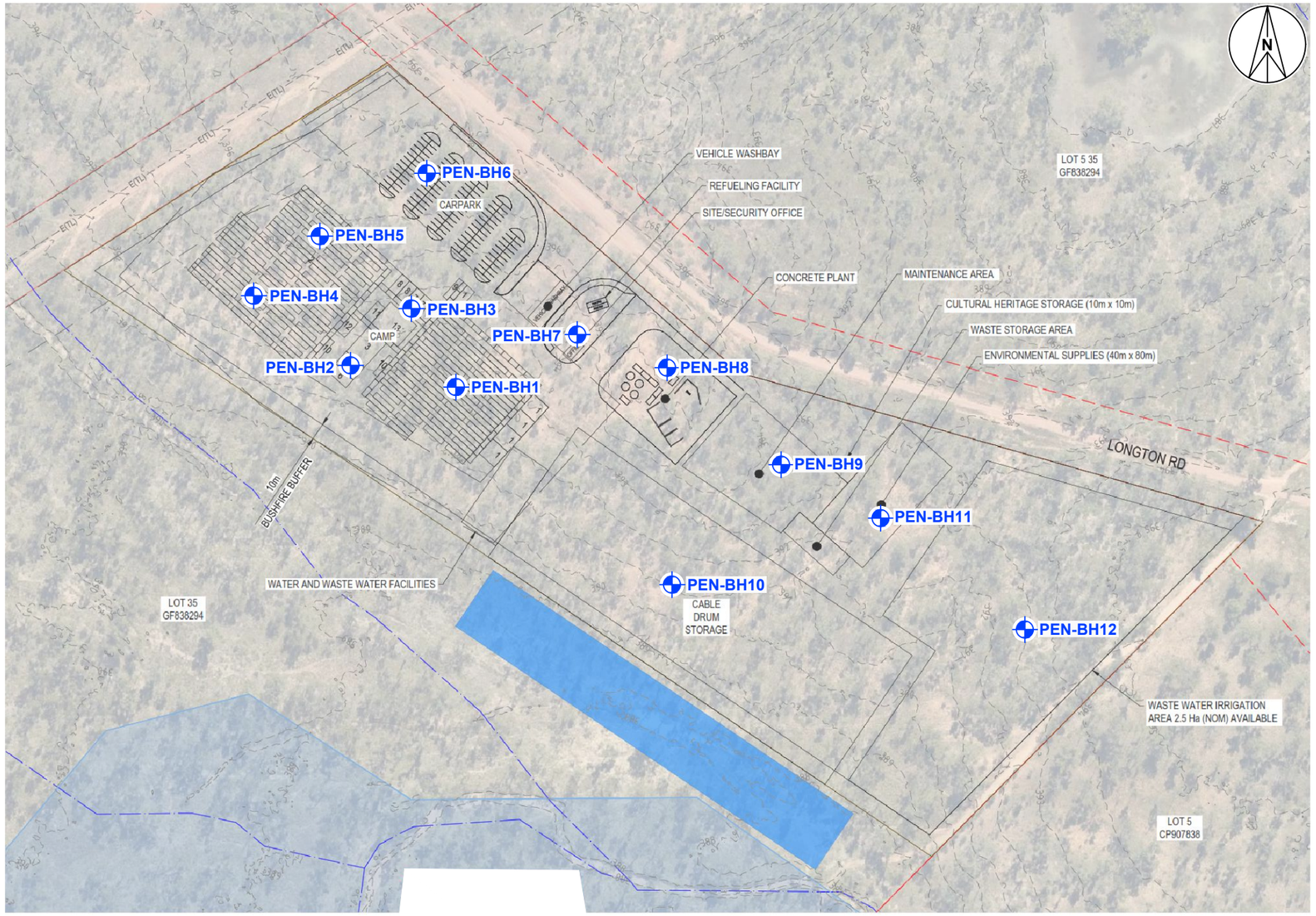
WKSP Z:\clients\HMA_Consulting\08-0004_CuString\Mapping\Workspaces\EIS\Stages.mxd
Created on 18/05/2010 by KR

DCDB CADASTRE

Name	Zone: 55K	
	Easting	Northing
PEN-BH1	334446	7728670
PEN-BH2	334377	7728676
PEN-BH3	334431	7728724
PEN-BH4	334316	7728719
PEN-BH5	334385	7728774
PEN-BH6	334469	7728791
PEN-BH7	334520	7728687
PEN-BH8	334600	7728678
PEN-BH9	334643	7728624
PEN-BH10	334646	7728533
PEN-BH11	334738	7728595
PEN-BH12	334820	7728558

PENTLAND
CAMP REQUIREMENTS (TBC) - 300 PEOPLE

ROOMS:	300 (100 modules)
OFFICE:	1
KITCHEN:	2
FOOD PREP/STORE	3
DINNING:	6
SERVERIES:	1
LAUNDRY:	4
WET MESS:	1
FIRST AID ROOM:	1
GYMS:	3
REC ROOM	2
W/C BLOCK	1



JULIA CREEK USED AND REQUIRED ACQUISITION AREAS

TOTAL 124490m² OF LAND ACQUISITION AREA USED = 100%

TOTAL 10000m² (1.0 Ha) ADDITIONAL LAND ACQUISITION AREA PROPOSED FOR ADDITIONAL WASTEWATER IRRIGATION

TO PROTECT THE ENVIRONMENT, CLEARING SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHALL BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

-WARNING-

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

LEGEND:-

Borehole Location and Number

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.
2. Plan adapted from drawing No.CU2-HU00-DRG-PAS-100-0002 provided by UGL Pty Limited.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited

OFFICE: Brisbane | DRAWN BY: JST

SCALE: As shown | DATE: 4 October 2023

TITLE: **SITE AND TEST LOCATION PLAN**
COPPERSTRING 2.0 - PROPOSED SUBSTATIONS
PENTLAND - CAMP & LAYDOWN

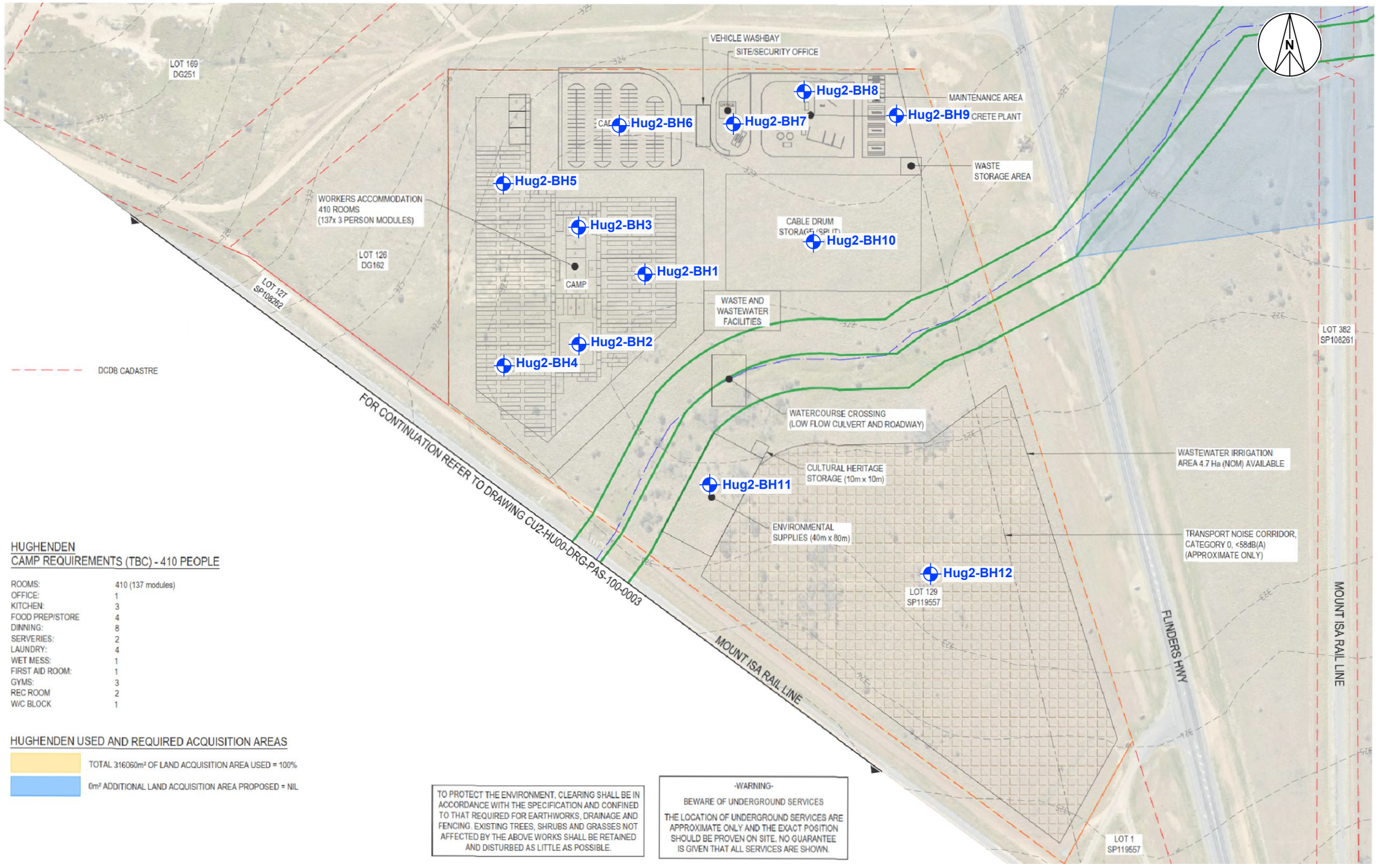
0 20 40 60 80 100
SCALE 1:3,000 (A3)

PROJECT No: 200446.02

DRAWING No: 5

REVISION: 0

P:\200446.02 - WOODSTOCK to MT ISA, Proposed Substation\7.0 Drawings\7.2 Out\PENTLAND - CAMP & LAYDOWN\200446.02.D.005.Rev0. PENTLAND - CAMP & LAYDOWN.dwg



HUGHENDEN
CAMP REQUIREMENTS (TBC) - 410 PEOPLE

ROOMS:	410 (137 modules)
OFFICE:	1
KITCHEN:	3
FOOD PREP/STORE	4
DINNING:	8
SERVERIES:	2
LAUNDRY:	4
WET MESS:	1
FIRST AID ROOM:	1
GYMS:	3
REC ROOM	2
W/C BLOCK	1

HUGHENDEN USED AND REQUIRED ACQUISITION AREAS

TOTAL 316060m² OF LAND ACQUISITION AREA USED = 100%

0m² ADDITIONAL LAND ACQUISITION AREA PROPOSED = NIL

TO PROTECT THE ENVIRONMENT, CLEARING SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHALL BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

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Name	Zone: 55K	
	Easting	Northing
Hug2-BH1	208554	7691021
Hug2-BH2	208502	7690971
Hug2-BH3	208492	7691079
Hug2-BH4	208423	7690968
Hug2-BH5	208419	7691122
Hug2-BH6	208512	7691160
Hug2-BH7	208580	7691138
Hug2-BH8	208649	7691167
Hug2-BH9	208714	7691149
Hug2-BH10	208637	7691077
Hug2-BH11	208576	7690909
Hug2-BH12	208745	7690811

LEGEND:-

Borehole Location and Number

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.
2. Plan adapted from drawing No.CU2-HU00-DRG-PAS-100-0003 provided by UGL Pty Limited.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited

OFFICE: Brisbane | DRAWN BY: JST

SCALE: As shown | DATE: 4 October 2023

TITLE: **SITE AND TEST LOCATION PLAN**
COPPERSTRING 2.0 - PROPOSED SUBSTATIONS
HUGHENDEN - CAMP & LAYDOWN

0 20 40 60 80 100
SCALE 1:3,000 (A3)

PROJECT No: 200446.02

DRAWING No: 3

REVISION: 0

P:\200446.02 - WOODSTOCK to MT ISA, Proposed Substation\7.0 Drawings\7.2 Out\HUGHENDEN - CAMP & LAYDOWN\200446.02.D.001.Rev0. HUGHENDEN - CAMP & LAYDOWN.dwg



Name	Zone: 54K	
	Easting	Northing
RIC-BH1	722229	7706793
RIC-BH2	722157	7706849
RIC-BH3	722215.85	7706878.43
RIC-BH4	722152.1	7706921.1
RIC-BH5	722117.33	7706973.55
RIC-BH6	722079.02	7707031.42
RIC-BH7	722130.64	7706798.28
RIC-BH8	722096.34	7706840.56
RIC-BH9	722046.25	7706916.52
RIC-BH10	722003.79	7706979.23
RIC-BH11	722177.31	7706690.7
RIC-BH12	722189.09	7706626.61

LEGEND:-

Borehole Location and Number

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited	
OFFICE: Brisbane	DRAWN BY: JST
SCALE: As shown	DATE: 4 October 2023

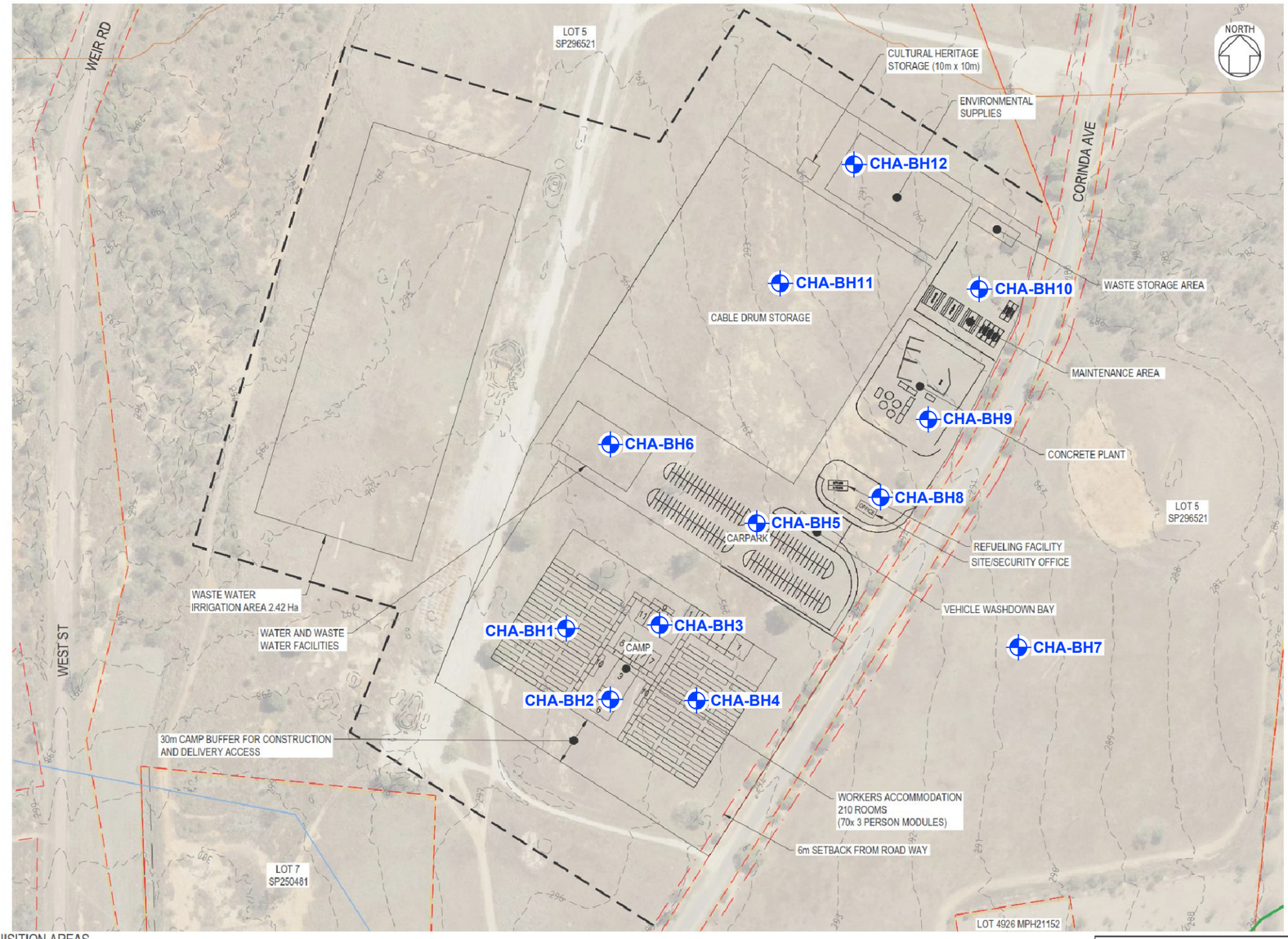
TITLE: **SITE AND TEST LOCATION PLAN**
COPPERSTRING 2.0 - PROPOSED SUBSTATIONS
RICHMOND - CAMP & LAYDOWN

0 20 40 60 80 100
SCALE 1:3,000 (A3)

PROJECT No:	200446.02
DRAWING No:	6
REVISION:	0

P:\200446.02 - WOODSTOCK to MT ISA, Proposed Substation\7.0 Drawings\7.2 Out\RICHMOND - CAMP & LAYDOWN\200446.02.D.006.Rev0. RICHMOND - CAMP & LAYDOWN.dwg

MM: Ensure Charters Towers camp layout is consistent with the GIS footprint.



DCDB CADASTRE

CHARTERS TOWERS
CAMP REQUIREMENTS (TBC) - 210 PEOPLE

ROOMS:	210 (70 modules)
OFFICE:	1
KITCHEN:	2
FOOD PREP/STORE	3
DINNING:	5
SERVERIES:	1
LAUNDRY:	2
WET MESS:	1
FIRST AID ROOM:	1
GYMS:	3
REC ROOM	2
W/C BLOCK	1

CHARTERS TOWERS USED AND REQUIRED ACQUISITION AREAS

TOTAL 173895m² OF LAND ACQUISITION AREA USED = <100%

0m² ADDITIONAL LAND ACQUISITION AREA PROPOSED = NIL

Name	Zone: 55K	
	Easting	Northing
CHA-BH1	423370	7782298
CHA-BH2	423398	7782242
CHA-BH3	423426	7782304
CHA-BH4	423451	7782257
CHA-BH5	423472	7782361
CHA-BH6	423385	7782381
CHA-BH7	423616	7782302
CHA-BH8	423538	7782386
CHA-BH9	423550	7782436
CHA-BH10	423620	7782550
CHA-BH11	423501	7782508
CHA-BH12	423511	7782595

TO PROTECT THE ENVIRONMENT, CLEARING SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHALL BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

-WARNING-

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LEGEND:-

Borehole Location and Number

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.
2. Plan adapted from drawing No.CU2-CT00-DRG-PAS-100-0002 provided by UGL Pty Limited.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited		
OFFICE: Brisbane	DRAWN BY: JST	
SCALE: As shown	DATE: 4 October 2023	

TITLE: **SITE AND TEST LOCATION PLAN**
COPPERSTRING 2.0 - PROPOSED SUBSTATIONS
CHARTERS TOWERS - CAMP & LAYDOWN

0 20 40 60 80 100
SCALE 1:3,000 (A3)

PROJECT No: 200446.02
DRAWING No: 7
REVISION: 0

P:\200446.02 - WOODSTOCK to MT ISA, Proposed Substation\7.0 Drawings\7.2 Out\CHARTERS TOWERS - CAMP & LAYDOWN\200446.02.D.007.Rev0. CHARTERS TOWERS - CAMP & LAYDOWN.dwg



Name	Zone: 54K	
	Easting	Northing
Jul-BH1	576761	7716379
Jul-BH2	576820	7716360
Jul-BH3	576779	7716321
Jul-BH4	576726	7716272
Jul-BH5	576787	7716262
Jul-BH6	576845	7716300
Jul-BH7	576868	7716389
Jul-BH8	576897	7716274
Jul-BH9	576949	7716342
Jul-BH10	577024	7716231
Jul-BH11	576976	7716212
Jul-BH12	576803	7716167

LEGEND:-

Borehole Location and Number

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited		
OFFICE: Brisbane	DRAWN BY: JST	
SCALE: As shown	DATE: 4 October 2023	

TITLE: **SITE AND TEST LOCATION PLAN**
COPPERSTRING 2.0 - PROPOSED SUBSTATIONS
JULIA CREEK - CAMP & LAYDOWN

0 25 50 75 100
SCALE 1: 2,500 (A3)

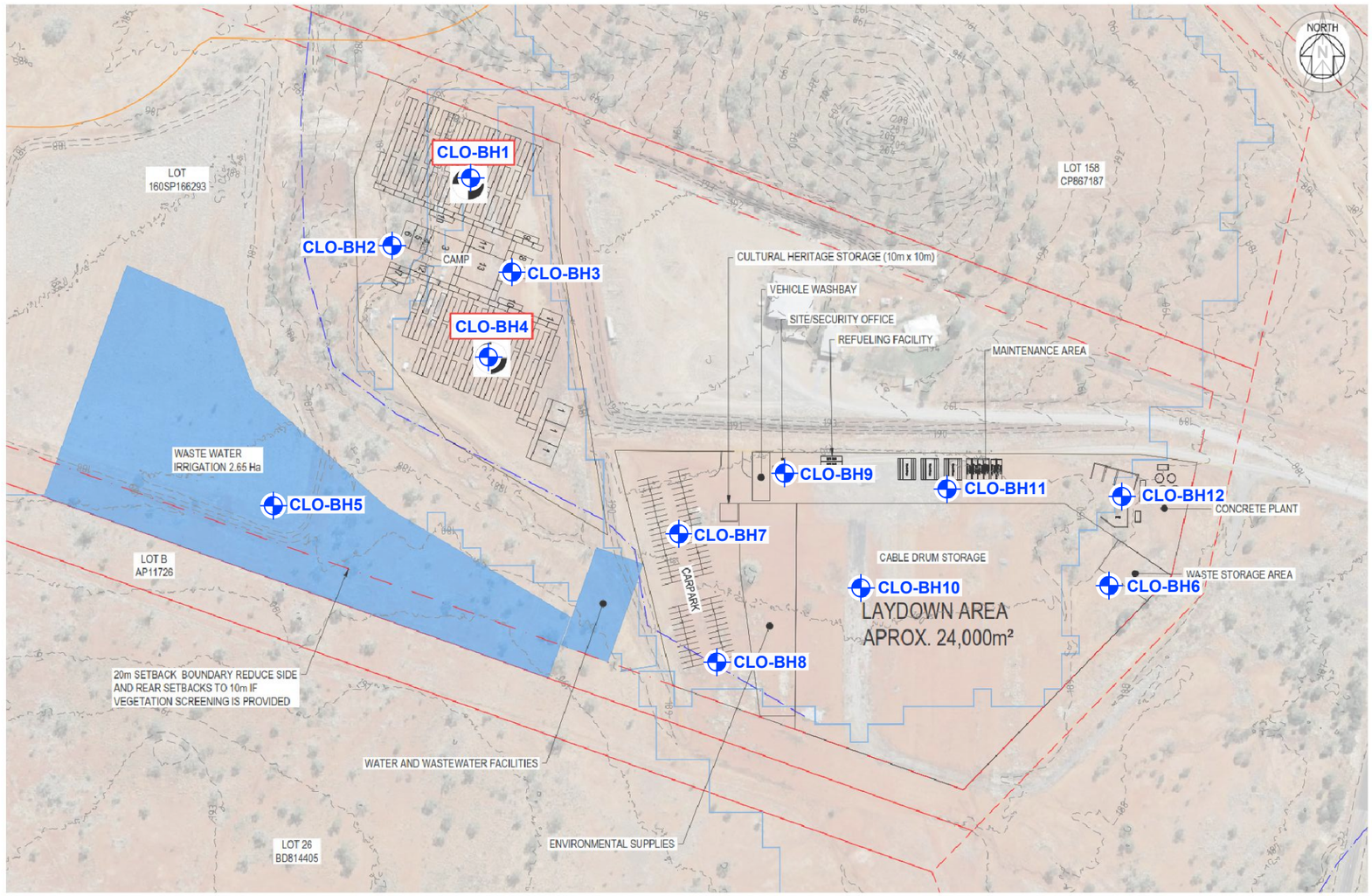
PROJECT No:	200446.02
DRAWING No:	4
REVISION:	0

P:\200446.02 - WOODSTOCK to MT ISA, Proposed Substation\7.0 Drawings\7.2 Out\JULIA CREEK - CAMP & LAYDOWN\200446.02.D.004.Rev0. JULIA CREEK - CAMP & LAYDOWN.dwg

DCDB CADASTRE

CLONCURRY
CAMP REQUIREMENTS (TBC)- 230 PEOPLE

ROOMS:	230 (80 modules)
OFFICE:	1
KITCHEN:	2
FOOD PREP/STORE	3
DINNING:	5
SERVERIES:	1
LAUNDRY:	2
WET MESS:	1
FIRST AID ROOM:	1
GYMS:	3
REC ROOM	2
W/C BLOCK	1



Name	Zone: 54K	
	Easting	Northing
CLO-BH1	445902	7713433
CLO-BH2	445864	7713398
CLO-BH3	445920	7713399
CLO-BH4	445899	7713366
CLO-BH5	445884	7713223
CLO-BH6	446277	7713207
CLO-BH7	446013	7713241
CLO-BH8	446031	7713175
CLO-BH9	446104	7713268
CLO-BH10	446113	7713218
CLO-BH11	446159	7713279
CLO-BH12	446297	7713268

CLONCURRY USED AND REQUIRED ACQUISITION AREAS

TOTAL 77815m² OF LAND ACQUISITION AREA USED = 100%

TOTAL 28000m² (2.8 Ha) ADDITIONAL LAND ACQUISITION AREA PROPOSED:
- WASTEWATER IRRIGATION 26500m² (2.65 Ha)
- WATER STORAGE TANKS AND BORE FACILITIES 1500m² (0.15 Ha)

TO PROTECT THE ENVIRONMENT, CLEARING SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHALL BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

-WARNING-

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

LEGEND:-

Borehole Location and Number

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.
2. Plan adapted from drawing No.CU2-CL00-DRG-PAS-100-0002 provided by UGL Pty Limited.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited

OFFICE: Brisbane | DRAWN BY: JST

SCALE: As shown | DATE: 4 October 2023

TITLE: **SITE AND TEST LOCATION PLAN**
COPPERSTRING 2.0 - PROPOSED SUBSTATIONS
CLONCURRY - CAMP & LAYDOWN

0 20 40 60 80 100
SCALE 1:3,000 (A3)

PROJECT No: 200446.02

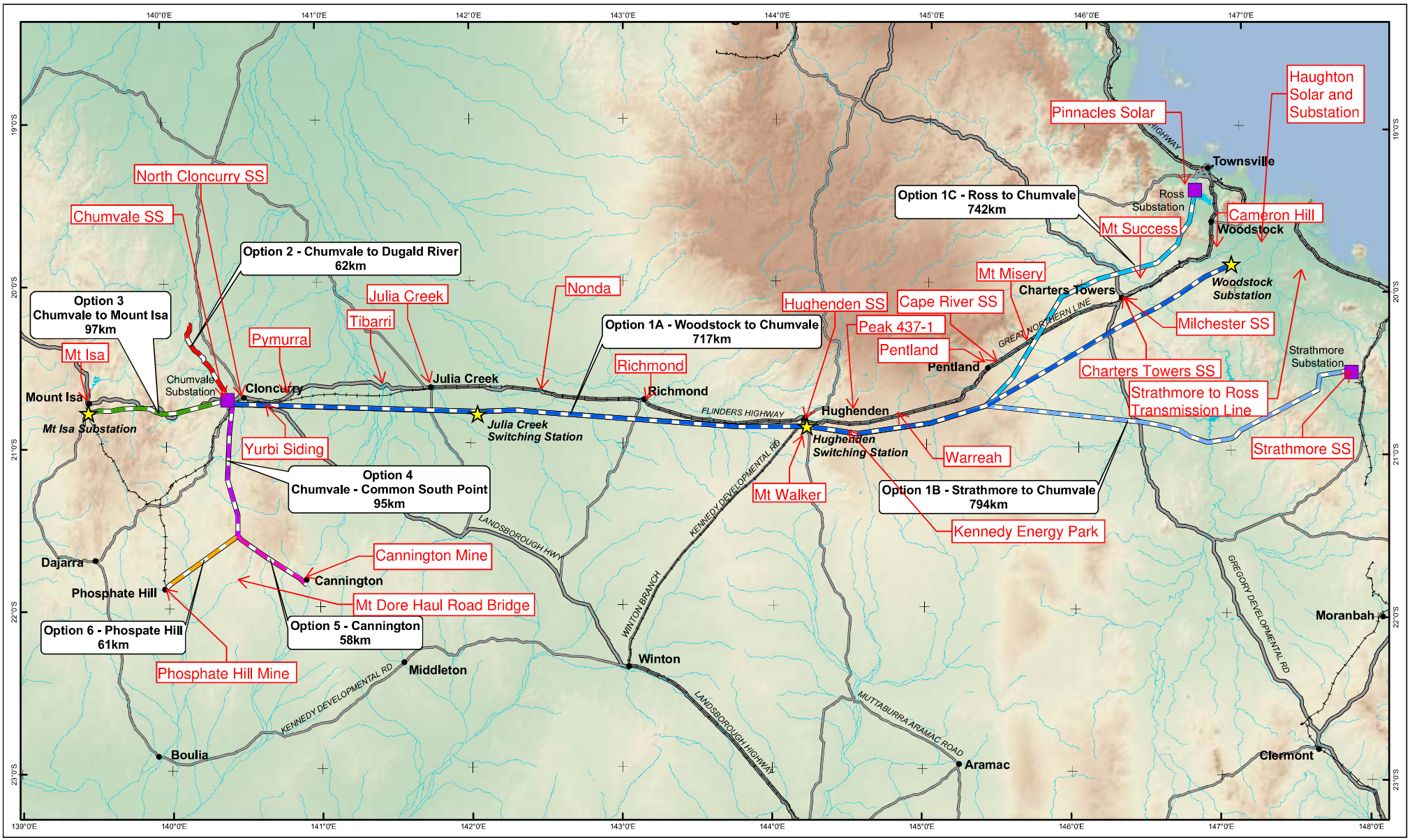
DRAWING No: 8

REVISION: 0

P:\200446.02 - WOODSTOCK to MT ISA, Proposed Substation\7.0 Drawings\7.2 Out\CLONCURRY - CAMP & LAYDOW\200446.02.D.008.Rev0. CLONCURRY - CAMP & LAYDOW.dwg

Appendix C

Substations Sampling Locations



NOTES

DISCLAIMER
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

LEGEND

Copper String Routes (Rev C)
- Option 1A - Woodstock to Chumvale
- Option 1B - Ross to Chumvale
- Option 1C - Strathmore to Chumvale
- Option 2 - Chumvale to Dugald River
- Option 3 - Chumvale to Mount Isa
- Option 4 - Chumvale - Common South Point
- Option 5 - Cannington
- Option 6 - Phospate Hill

- Proposed Substation Locations
- Existing Substation
- Major Watercourse
- Railway
- Highway
- Secondary Road
- Reservoirs

0 40 80 120 160
Kilometers
Datum: GDA94
Projection: Custom MGA94 Zone 54/55

PROJECT COPPERSTRING TRANSMISSION LINK
TITLE PROJECT STAGES
DATE MAY 2010

Drawing 1

WKSP Z:\clients\HMA_Consulting\08-0004_CuString\Mapping\Workspaces\EIS\Stages.mxd
Created on 18/05/2010 by KR



Name	Easting	Northing	Latitude	Longitude
MIS-BH8_H1	342847.087	7702231.82	139.490281	-20.7730766
MIS-BH6_H1	342802.088	7702231.82	139.489849	-20.7730728
MIS-BH19_H1	342786.387	7702108.52	139.489687	-20.7741852
MIS-TP9_H1	342842.238	7702085.15	139.490221	-20.7744011
MIS-TP15_H1	342837.2	7701962.42	139.490162	-20.7755092
MIS-BH27_H1	342786.387	7701990.52	139.489677	-20.7752511

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.

LEGEND:-

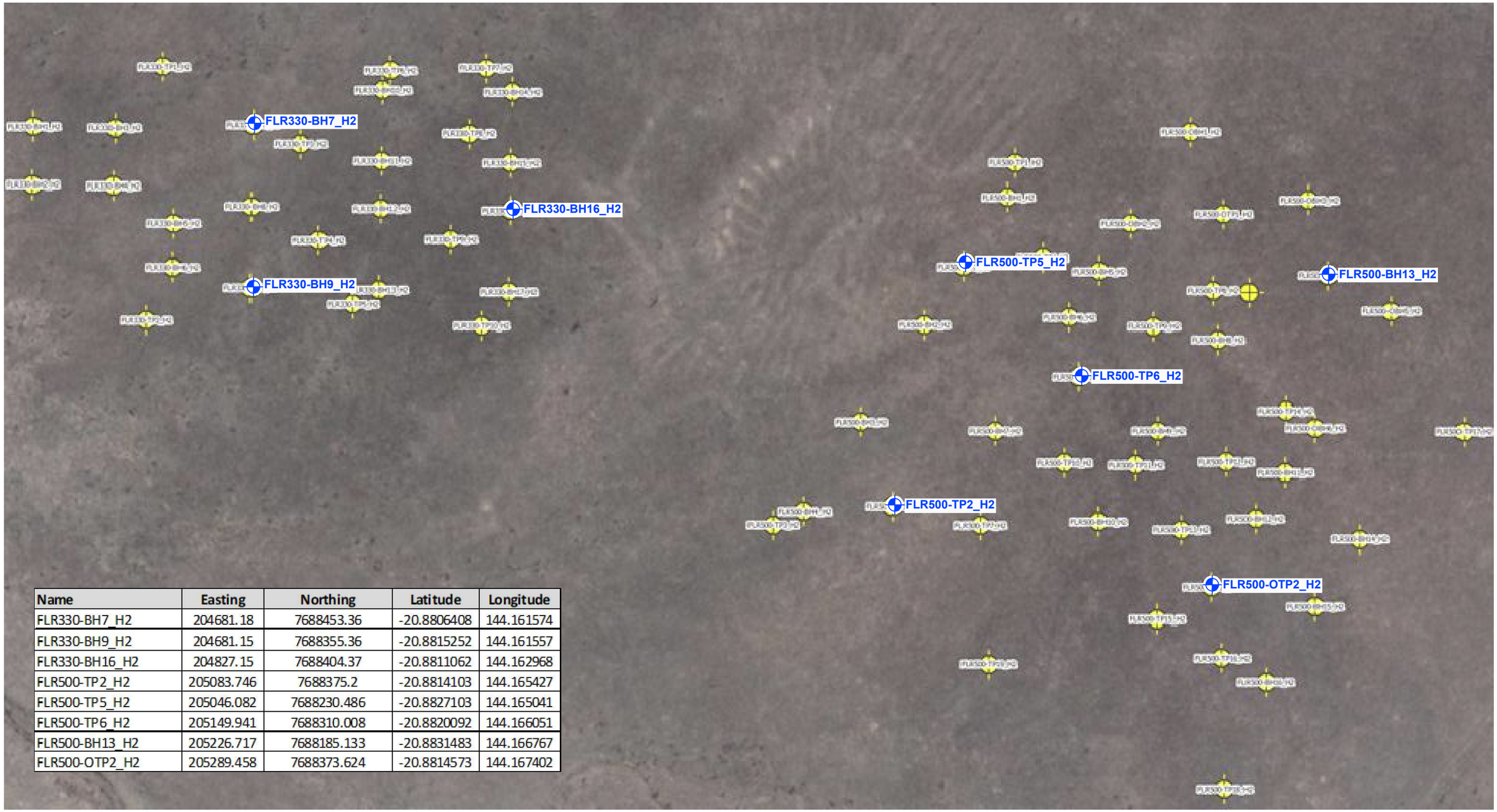
- Enviro Test Location and Number
- Geotech Test Location and Number

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited		TITLE: **SITE AND TEST LOCATION PLAN** **COPPERSTRING 2.0 - PROPOSED SUBSTATIONS** **Lot 422 on SP 128451, MOUNT ISA CITY COUNCIL (MIS)**
OFFICE: Brisbane	DRAWN BY: JST	
SCALE: NTS	DATE: 19 September 2023	

PROJECT No: 200446.02
DRAWING No: 1
REVISION: 0

P:\200446.02 - WOODSTOCK to MT ISA, Proposed Substation\7.0 Drawings\7.2 Out\01 SUBSTATIONS\Mount Isa City Council (MIS)\200446.02.D.001.Rev0.Mount Isa City Council (MIS).dwg



Name	Easting	Northing	Latitude	Longitude
FLR330-BH7_H2	204681.18	7688453.36	-20.8806408	144.161574
FLR330-BH9_H2	204681.15	7688355.36	-20.8815252	144.161557
FLR330-BH16_H2	204827.15	7688404.37	-20.8811062	144.162968
FLR500-TP2_H2	205083.746	7688375.2	-20.8814103	144.165427
FLR500-TP5_H2	205046.082	7688230.486	-20.8827103	144.165041
FLR500-TP6_H2	205149.941	7688310.008	-20.8820092	144.166051
FLR500-BH13_H2	205226.717	7688185.133	-20.8831483	144.166767
FLR500-OTP2_H2	205289.458	7688373.624	-20.8814573	144.167402

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.

LEGEND:-

- Enviro Test Location and Number
- Geotech Test Location and Number

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited		TITLE: **SITE AND TEST LOCATION PLAN** **COPPERSTRING 2.0 - PROPOSED SUBSTATIONS** **Lot 1 DG35, FINDERS 300 & 500 (FL)**
OFFICE: Brisbane	DRAWN BY: JST	
SCALE: NTS	DATE: 20 September 2023	

PROJECT No: 200446.02
DRAWING No: 2
REVISION: 0

P:\200446.02 - WOODSTOCK to MT ISA, Proposed Substation\7.0 Drawings\7.2 Out\01 SUBSTATIONS\Finders 300 & 500 (FL)\200446.02.D.002.Rev0.Finders 300 & 500 (FL).dwg



Name	Easting	Northing	Latitude	Longitude
PTL-TP1_H2	353591.272	7717899.1	-20.6324267	145.594778
PTL-BH2_H2	353702.787	7717818.64	-20.6331622	145.595841
PTL-TP4_H2	353726.659	7717931.11	-20.6321481	145.59608
PTL-TP6_H2	353791.928	7717869.49	-20.6327098	145.596701
PTL-BH8_H2	353762.386	7718045.53	-20.6311173	145.596432
PTL-BH9_H2	353852.743	7717954.41	-20.6319475	145.597291

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.

LEGEND:-

- Enviro Test Location and Number
- Geotech Test Location and Number

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited		
OFFICE: Brisbane	DRAWN BY: JST	
SCALE: NTS	DATE: 20 September 2023	

TITLE: **SITE AND TEST LOCATION PLAN**
COPPERSTRING 2.0 - PROPOSED SUBSTATIONS
Lot 61 GF812272, PENTLAND (PTL)

PROJECT No: 200446.02
DRAWING No: 3
REVISION: 0

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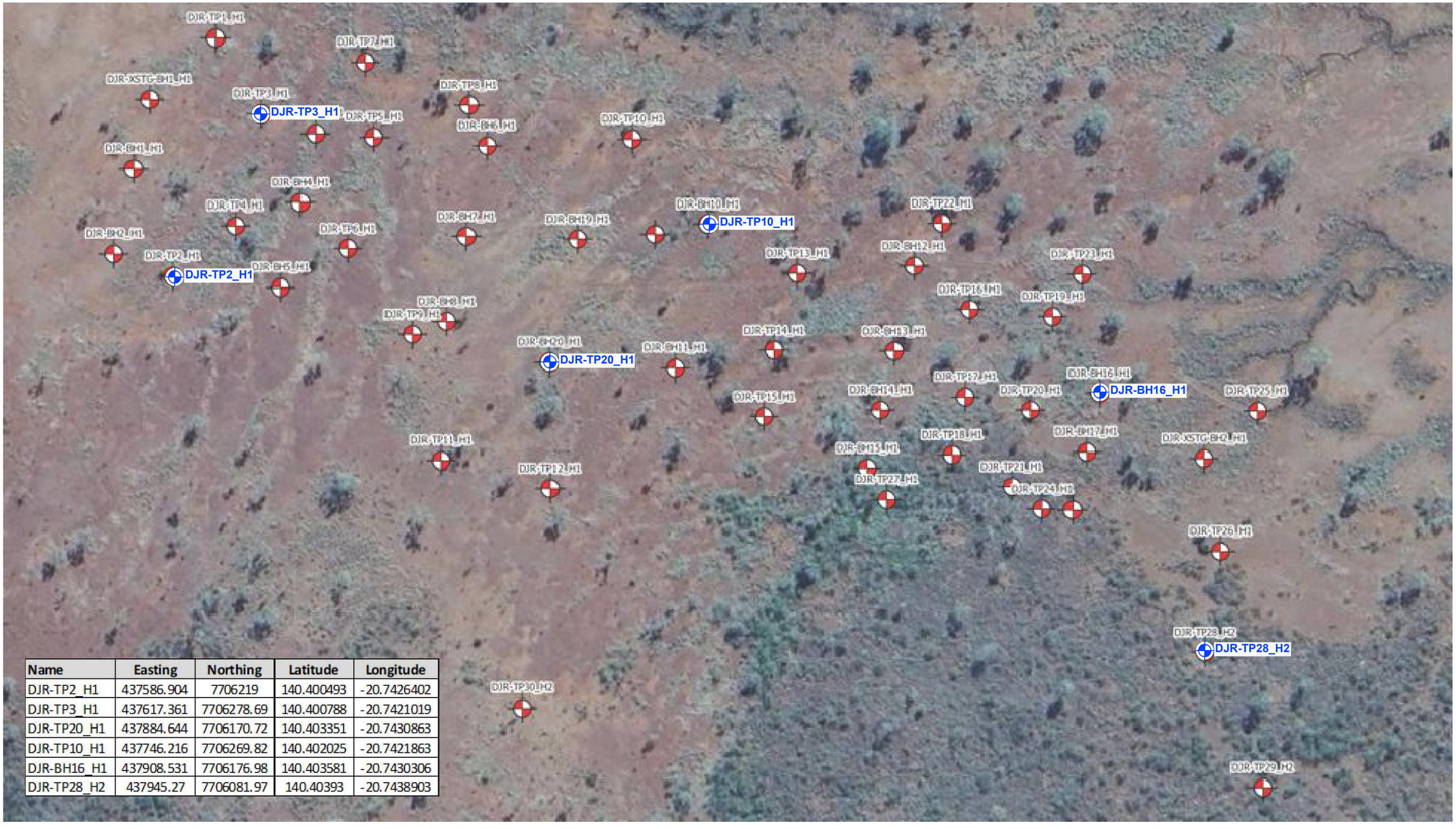
MM: Ensure contaminated land investigation locations consider the current Cultural Heritage matters identified in the October 2023 site survey program completed by Mitakoodi.



Name	Easting	Northing	Latitude	Longitude
DJR-TP2_H1	437586.904	7706219	140.400493	-20.7426402
DJR-TP3_H1	437617.361	7706278.69	140.400788	-20.7421019
DJR-TP20_H1	437884.644	7706170.72	140.403351	-20.7430863
DJR-TP10_H1	437746.216	7706269.82	140.402025	-20.7421863
DJR-BH16_H1	437908.531	7706176.98	140.403581	-20.7430306
DJR-TP28_H2	437945.27	7706081.97	140.40393	-20.7438903

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.

LEGEND:-

- Enviro Test Location and Number
- Geotech Test Location and Number

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited		
OFFICE: Brisbane	DRAWN BY: JST	
SCALE: NTS	DATE: 20 September 2023	

TITLE: **SITE AND TEST LOCATION PLAN**
COPPERSTRING 2.0 - PROPOSED SUBSTATIONS
Lot 521 on CP905413, DAJARRA ROAD (DJR)

PROJECT No:	200446.02
DRAWING No:	4
REVISION:	0

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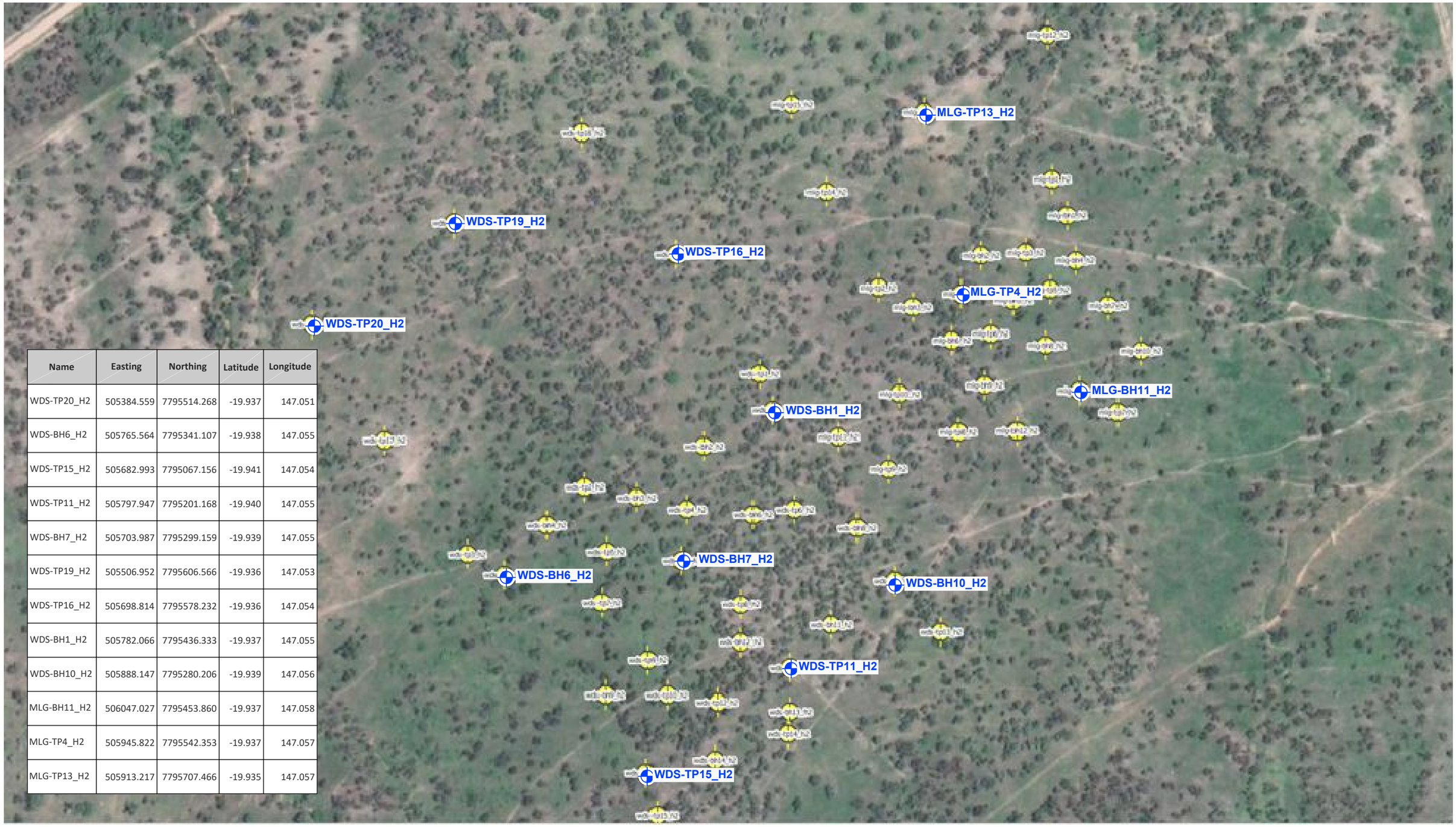

Name	Easting	Northing	Latitude	Longitude
WDS-TP20_H2	505384.559	7795514.268	-19.937	147.051
WDS-BH6_H2	505765.564	7795341.107	-19.938	147.055
WDS-TP15_H2	505682.993	7795067.156	-19.941	147.054
WDS-TP11_H2	505797.947	7795201.168	-19.940	147.055
WDS-BH7_H2	505703.987	7795299.159	-19.939	147.055
WDS-TP19_H2	505506.952	7795606.566	-19.936	147.053
WDS-TP16_H2	505698.814	7795578.232	-19.936	147.054
WDS-BH1_H2	505782.066	7795436.333	-19.937	147.055
WDS-BH10_H2	505888.147	7795280.206	-19.939	147.056
MLG-BH11_H2	506047.027	7795453.860	-19.937	147.058
MLG-TP4_H2	505945.822	7795542.353	-19.937	147.057
MLG-TP13_H2	505913.217	7795707.466	-19.935	147.057

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.

LEGEND:-

- Enviro Test Location and Number
- Geotech Test Location and Number

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: UGL Pty Limited	
OFFICE: Brisbane	DRAWN BY: JST
SCALE: NTS	DATE: 19 September 2023

TITLE: **SITE AND TEST LOCATION PLAN**
COPPERSTRING 2.0 - PROPOSED SUBSTATIONS
Lot 71 SP289517, WOODSTOCK AND MULGRAVE (WDS and MLG)

PROJECT No:	200446.02
DRAWING No:	5
REVISION:	0

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Appendix D

Site Photographs



Photograph 1: View of Sampling Location CLBH1



Photograph 2: View of Sampling Location CLBH3

Douglas Partners	Project No. 200446.02	Site Photographs - Cloncurry campsites	Plate No. 1 of 3
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 3: View of Sampling Location CLBH4



Photograph 4: View of Sampling Location CLBH11



Photograph 5: View of Sampling Location CLBH6



Photograph 6: View of Sampling Location CLBH8



Photograph 1: Sampling Location HUG1BH1



Photograph 2: Sampling Location HUG1BH2 (Lot 129 on SP119557)

Douglas Partners	Project No. 200446.02	Site Photographs - Hughenden, campsites	Plate No. 1 of 3
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 3: Sampling Location HUG1BH3



Photograph 4: Sampling Location HUG1BH4

Douglas Partners	Project No. 200446.02	Site Photographs - Hughenden, campsites	Plate No. 2 of 3
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 5: Sampling Location HUG1BH11



Photograph 6: Sampling Location HUG1BH7

Douglas Partners	Project No. 200446.02	Site Photographs - Hughenden, campsites	Plate No. 3 of 3
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 1: View of Sampling Location JULBH1.



Photograph 2: View of Sampling Location JULBH2.

Douglas Partners	Project No. 200446.02	Site Photographs – Julian Creek Campsites	Plate No. 1 of 3
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 3: View of Sampling Location JULBH3.



Photograph 4: View of Sampling Location JULBH7.



Photograph 5: View of Sampling Location JULBH8.



Photograph 6: View of Sampling Location JULBH10.

Douglas Partners	Project No. 200446.02	Site Photographs – Julian Creek Campsites	Plate No. 3 of 3
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 1: View of Sampling Location PENBH1.



Photograph 2: View of Sampling Location PENBH2.

Douglas Partners	Project No. 200446.02	Site Photographs - Pentland Campsites	Plate No. 1 of 3
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 3: View of Sampling Location PENBH5.



Photograph 4: View of Sampling Location PENBH8.

Douglas Partners	Project No. 200446.02	Site Photographs - Pentland Campsites	Plate No. 2 of 3
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 5: View of Sampling Location PENBH10.



Photograph 6: View of Sampling Location PENBH12.

Douglas Partners	Project No. 200446.02	Site Photographs - Pentland Campsites	Plate No. 3 of 3
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 1: View of Sampling Location RICBH1.



Photograph 2: View of Sampling Location RICBH2.



Photograph 3: View of Sampling Location RICBH3.



Photograph 4: View of Sampling Location RICBH4.



Photograph 5: View of Sampling Location RICBH6.



Photograph 6: View of Sampling Location RICBH9.

Douglas Partners	Project No. 200446.02	Site Photographs - Richmond campsites	Plate No. 3 of 6
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 7: View of site to north Sampling Location RICBH3.



Photograph 8: View of site to west Sampling Location RICBH3.

Douglas Partners	Project No. 200446.02	Site Photographs - Richmond campsites	Plate No. 4 of 6
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 9: Area used as council storage



Photograph 10: Sewer line manhole observed at the site



Photograph 11: Area used as council storage



Photograph 12: Area used as council storage.



Photograph 1: View of Sampling Location at Flinders Substation



Photograph 2: View of Sampling Location at Flinders Substation

Douglas Partners	Project No. 200446.02	Site Photographs - Flinders Substation	Plate No. 1 of 2
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 3: View of Sampling Location at Flinders Substation



Photograph 4: View of Sampling Location at Flinders Substation

Douglas Partners	Project No. 200446.02	Site Photographs - Flinders Substation	Plate No. 2 of 2
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 1: View of Sampling Location at Mt ISA Substation

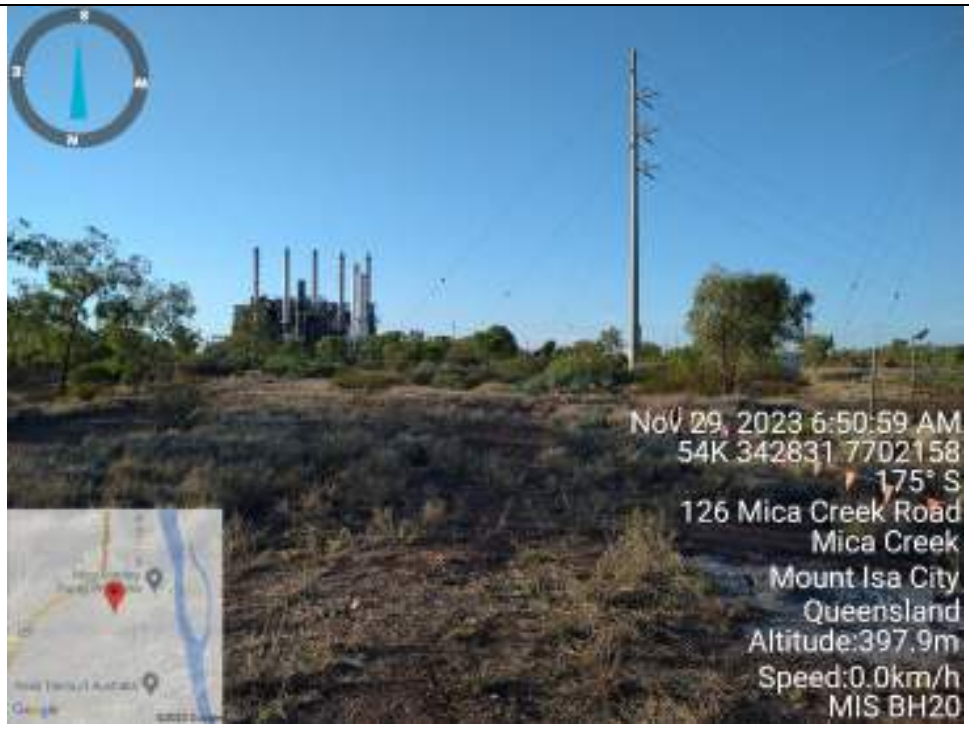


Photograph 2: View of Sampling Location at Mt ISA Substation

Douglas Partners	Project No. 200446.02	Site Photographs – Mt ISA Substation	Plate No. 1 of 7
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 3: View of Sampling Location at Mt ISA Substation



Photograph 4: View of Sampling Location at Mt ISA Substation



Photograph 5: View of Sampling Location at Mt ISA Substation



Photograph 6: View of Sampling Location at Mt ISA Substation

Douglas Partners	Project No. 200446.02	Site Photographs – Mt ISA Substation	Plate No. 3 of 7
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 7: View of Sampling Location at Mt ISA Substation



Photograph 8: View of Sampling Location at Mt ISA Substation

Douglas Partners	Project No. 200446.02	Site Photographs – Mt ISA Substation	Plate No. 4 of 7
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 9: Black ash was observed at the borehole MIS_TP11-H1



Photograph 10: View of Sampling Location at Mt ISA Substation



Photograph 11: View of Sampling Location at Mt ISA Substation



Photograph 12: View of Sampling Location at Mt ISA Substation



Photograph 13: View of Sampling Location at Mt ISA Substation



Photograph 14: View of Sampling Location at Mt ISA Substation

Douglas Partners	Project No. 200446.02	Site Photographs – Mt ISA Substation	Plate No. 7 of 7
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 1: View of Sampling Location at DJR-BH1-K1



Photograph 2: Panoramic View of Sampling Location at DJR-BH4-K1

Douglas Partners	Project No. 200446.02	Site Photographs – Dajarra Substation	Plate No. 1 of 5
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 3: View of Sampling Location at DJR-BH5-K1



Photograph 4: View of Sampling Location at DJR-BH13-K1



Photograph 5: View of Sampling Location at DJR-BH16-K1



Photograph 6: View of Sampling Location at DJR-BH17-K1

Douglas Partners	Project No. 200446.02	Site Photographs – Dajarra Substation	Plate No. 3 of 5
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	



Photograph 7: View of Sampling Location at DJR-TP7-K1



Photograph 8: View of Sampling Location at DJR-TP12-K1



Photograph 9: View of Sampling Location at DJR-TP19-K1



Photograph 10: View of Sampling Location at DJR-TP8-K1

Douglas Partners	Project No. 200446.02	Site Photographs – Dajarra Substation	Plate No. 5 of 5
	Walkover Date: Oct 2023 – Jan 2024	Environmental Site Investigation (Contamination) Proposed Campsites and Substations Woodstock to Mt Isa, Various Client: CPB Contractors Pty Ltd	

Appendix E

Data Quality Assessment

Appendix E
Data Quality Assessment

E1.0 Field and Laboratory Data Quality Assurance and Quality Control

The field and laboratory data quality assurance and quality control (QA/QC) procedures and results are summarised in the following Table 1. Reference should be made to the field work methodology and the laboratory results/certificates of analysis for further details. The relative percentage difference (RPD) results, along with the other field QC samples are included in the summary results tables QA1 to QA3 provided at the end of Appendix H.

Table 1: Field and Laboratory Quality Control

Item	Evaluation / Acceptance Criteria	Compliance
Analytical laboratories used	National Association of Testing Authorities (NATA) accreditation	C
Holding times	Various based on type of analysis	C
Intra-laboratory replicates	5% 10% of primary samples; <30% RPD	PC
Inter-laboratory replicates	5% 10% of primary samples; <30% RPD	PC
Trip Spikes	One per sampling event; 60-140% recovery	PC
Trip Blanks	One per sampling event; < LOR	C
Rinsate	One per sampling event; <LOR	C
Laboratory / Reagent Blanks	One per batch; <LOR	C
Laboratory Duplicate	One per lab batch; As laboratory certificate	C
Matrix Spikes	One per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Surrogate Spikes	All organics analysis; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Control Samples	One per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Sampling, analysis and quality plan (SAQP)	Adopting SAQP for all aspects of the sampling field work	C

Notes:
C = compliance; PC = partial compliance; NC = non-compliance
LOR = Laboratory Limit of Reporting

The RPD results were all within the acceptable range, except for chromium, copper, lead, nickel and zinc indicated in orange in Table QA1. The exceedances are not, however, considered to be of concern given that:

- The number of replicate pairs being collected from heterogeneous soil samples;
- Replicates, rather than homogenised duplicates, were used to minimise risk of volatile loss, hence greater variability can be expected;
- Most of the recorded organic concentrations being reported at or below the LOR;
- The majority of RPD within a replicate pair being within the acceptable limits; and
- All other QA/QC parameters met the data quality indicators.

In summary, the QC data is determined to be of sufficient quality to be considered acceptable for the assessment.

E2.0 Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQI) as outlined in NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [the 'NEPM']* (NEPC, 2013):

- Completeness: a measure of the amount of usable data from a data collection activity;
- Comparability: the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event;
- Representativeness: the confidence (qualitative) of data representativeness of media present on-site;
- Precision: a measure of variability or reproducibility of data; and
- Accuracy: a measure of closeness of the data to the 'true' value.

Table 2: Data Quality Indicators

Data Quality Indicator	Method(s) of Achievement
Completeness	Judgmental selected target locations sampled.
	Preparation of surface water sampling sheets, sample location plan and chain of custody records.
	Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody.
	Samples analysed for contaminants of potential concern (CoPC) identified in the conceptual site model (CSM).
	Completion of chain of custody (CoC) documentation.
	NATA accredited laboratory results certificates provided by the laboratory.
	Satisfactory frequency and results for field and laboratory quality control (QC) samples as discussed in Section 1.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project.
	Experienced sampler(s) used.
	Use of NATA accredited laboratories, with test methods the same or similar between laboratories.
	Satisfactory results for field and laboratory QC samples.
Representativeness	Target media sampled.
	Sample numbers recovered and analysed are considered to be representative of the target media and complying with DQO.
	Samples were extracted and analysed within relevant holding times.
	Samples were analysed in accordance with the COC.
Precision	Field staff followed standard operating procedures.
	Acceptable RPD between original samples and replicates.
	Satisfactory results for all other field and laboratory QC samples.
Accuracy	Field staff followed standard operating procedures.
	Satisfactory results for all field and laboratory QC samples.

Based on the results of the field QA and field and laboratory QC, and evaluation against the DQI it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

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Appendix F

Borehole Logs and Explanatory Notes

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Cloncurry Camp Site - via Burke Developmental Road, Cloncurry

SURFACE LEVEL: --
EASTING: 445918
NORTHING: 7713443
DIP/AZIMUTH: 90°/--

BORE No: CLO-BH1
PROJECT No: 200446.01
DATE: 21/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Gravelly Sandy CLAY (CL): low plasticity, red-brown, fine to coarse sand, with fine to coarse gravel, w<PL, hard (residual)		B	0.0				
				D	0.2				
	0.3	Clayey Sandy GRAVEL (GC): fine to coarse, red-brown, fine to coarse sand, low plasticity clay, dry, very dense (residual, extremely weathered granite)		E	0.3				
				D					
				E	0.5				
					0.8				
	1			E	1.0				1
				S			24, 20, 13/30mm HB		
					1.3				
				E	1.33				
					1.5				
	1.8	GRANITE: red-brown, very low strength, highly weathered (Levian Granite)			1.8				
				D					
	2 2.01	Bore discontinued at 2.01m depth - Auger refusal on low strength or stronger rock		S	2.0 2.01		10/10mm HB		2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Cloncurry Camp Site - via Burke Developmental Road, Cloncurry

SURFACE LEVEL: --
EASTING: 445872
NORTHING: 7713402
DIP/AZIMUTH: 90°/--

BORE No: CLO-BH2
PROJECT No: 200446.01
DATE: 21/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.0	Gravelly Sandy CLAY (CL-CI): low to medium plasticity, red-brown, fine to coarse sand, fine to coarse gravel, w<PL, estimated very stiff (residual)		E	0.0				
	0.2				0.2				
	0.3			E	0.3				
	0.5				0.5				
	0.8			E	0.8				
1	1.0				1.0				1
	1.3	Gravelly Sandy CLAY (CL-CI): low to medium plasticity, dark red-brown, fine to coarse sand, fine to medium gravel, w<PL, estimated hard (residual)		E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				
2									2
3									3
4									4
5									5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased
TYPE OF BORING: 115mm diameter solid flight auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS: Coordinates are in GDA94 Zone 55K

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Cloncurry Camp Site - via Burke Developmental Road, Cloncurry

SURFACE LEVEL: --
EASTING: 445924
NORTHING: 7713399
DIP/AZIMUTH: 90°/--

BORE No: CLO-BH3
PROJECT No: 200446.01
DATE: 21/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.0	Gravelly Sandy CLAY (CL-CI): low to medium plasticity, red-brown, fine to coarse sand, fine to medium gravel, w<PL, estimated hard (residual)		E	0.0				
	0.3	Sandy CLAY (CI): medium plasticity, pale red-brown, fine to coarse sand, trace fine gravel, w<PL, estimated hard (residual)		E	0.3				
	0.5				0.5				
	0.8			E	0.8	R1,S1			
	1.0				1.0				
	1.3			E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased
TYPE OF BORING: 115mm diameter solid flight auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS: Coordinates are in GDA94 Zone 55K

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Cloncurry Camp Site - via Burke Developmental Road, Cloncurry

SURFACE LEVEL: --
EASTING: 445900
NORTHING: 7713367
DIP/AZIMUTH: 90°/--

BORE No: CLO-BH4
PROJECT No: 200446.01
DATE: 21/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Clayey GRAVEL (GC): fine to coarse, red-brown, low plasticity clay, with fine to coarse sand, moist, dense (residual)		B	0.0				
				D	0.2				
	0.3			E	0.3				
		Silty CLAY (CH): high plasticity, red-brown, with fine sand, trace fine gravel, w<PL, very stiff (residual)		D					
				E	0.5				
					0.8				
	1			E	1.0				1
				S			10,11,18 N = 29		
	1.3				1.3				
		Clayey SAND (SC): fine to coarse, pale red-brown and pale grey, low plasticity clay, with fine to coarse gravel, moist, medium dense (residual)		D					
				E	1.45				
					1.5				
	2								2
					2.5				
		- with relict rock structure, very dense (extremely weathered granite)		S			19, 30/110mm		
					2.76				
	3								3
	3.5								
		GRANITE: pale grey and red-brown, very low strength, highly weathered, with mica (Levian Granite)							
	4				4.0				4
				S			30/120mm HB		
					4.12				
	5								5
					5.5				
				S			21, 10/30mm HB		
	5.68				5.68				
		Bore discontinued at 5.68m depth - Limit of investigation							

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Cloncurry Camp Site - via Burke Developmental Road, Cloncurry

SURFACE LEVEL: --
EASTING: 445890
NORTHING: 7713217
DIP/AZIMUTH: 90°/--

BORE No: CLO-BH5
PROJECT No: 200446.01
DATE: 21/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Silty Sandy GRAVEL (GC): fine to coarse, red-brown, fine to coarse sand, low plasticity silt, dry, medium dense to dense (residual)		B D E	0.0 0.2 0.3				
	0.5	GRANITE: red-brown, very low strength, highly weathered (Levian Granite)		D E S E S	0.5 0.7 0.8 1.0		25, 12/50mm HB 15/40mm HB		
	1.04	Bore discontinued at 1.04m depth - Auger refusal on probable low strength or stronger rock			1.04				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased
TYPE OF BORING: 300mm diameter solid flight auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Cloncurry Camp Site - via Burke Developmental Road, Cloncurry

SURFACE LEVEL: --
EASTING: 446276
NORTHING: 7713211
DIP/AZIMUTH: 90°/--

BORE No: CLO-BH6
PROJECT No: 200446.01
DATE: 22/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Clayey SAND (SC): fine to coarse, red-brown, low plasticity clay, with fine to coarse gravel, moist, very dense (residual)		B	0.0				
	0.2			D	0.2				
	0.3			E	0.3				
	0.5			D	0.5				
	0.57			E	0.57				
				S			15/70mm HB		
	0.8			E	0.8				
	1.0				1.0				
	1.3	- with relict rock structure (extremely weathered granite)		D	1.3				
	1.5			E	1.5				
				S			13, 21, 30/130mm		
	1.93	Bore discontinued at 1.93m depth - Limit of investigation			1.93				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Cloncurry Camp Site - via Burke Developmental Road, Cloncurry

SURFACE LEVEL: --
EASTING: 446024
NORTHING: 7713234
DIP/AZIMUTH: 90°/--

BORE No: CLO-BH7
PROJECT No: 200446.01
DATE: 21/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.0	Gravelly Sandy CLAY (CL): low plasticity, red-brown, fine to medium sand, fine to medium gravel, w<PL, estimated very stiff (residual)		E	0.0				
	0.2				0.2				
	0.3			E	0.3				
	0.5				0.5				
	0.8			E	0.8				
	1.0				1.0				
	1.3			E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased
TYPE OF BORING: 115mm diameter solid flight auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS: Coordinates are in GDA94 Zone 55K

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Cloncurry Camp Site - via Burke Developmental Road, Cloncurry

SURFACE LEVEL: --
EASTING: 446030
NORTHING: 7713174
DIP/AZIMUTH: 90°/--

BORE No: CLO-BH8
PROJECT No: 200446.01
DATE: 22/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
		Sandy CLAY (CL): low plasticity, red-brown, with fine to coarse sand, trace fine to coarse gravel, w<PL, very stiff (residual)		B D E	0.0 0.2 0.3				
		- with fine to coarse gravel		D E	0.5				
				S D			16,14,13 N = 27		
	1			E	0.95 1.0 1.2				1
	1.3	GRANITE: red-brown, very low strength, highly weathered (Levian Granite)		D E	1.3 1.4		13/40mm HB		
	1.44	Bore discontinued at 1.44m depth - Limit of investigation		S	1.44				
	2								2
	3								3
	4								4
	5								5

Dynamic Penetrometer Test scale: 5, 10, 15, 20

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased
TYPE OF BORING: 300mm diameter solid flight auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Cloncurry Camp Site - via Burke Developmental Road, Cloncurry

SURFACE LEVEL: --
EASTING: 446107
NORTHING: 7713264
DIP/AZIMUTH: 90°/--

BORE No: CLO-BH9
PROJECT No: 200446.01
DATE: 21/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.1	FILL Sandy GRAVEL (GP): fine to coarse, brown and grey, fine to coarse gravel, w<PL, estimated medium dense		E	0.0				
				E	0.1				
		Silty CLAY (CI): medium plasticity, red-brown, with fine to medium sand, trace fine gravel, w<PL, estimated very stiff (residual)			0.3				
				E	0.4				
	0.7				0.6				
		Sandy CLAY (CL): low plasticity, pale grey and pale red-brown, fine to coarse sand, w<PL, estimated very stiff (residual)		E	0.8				
	1				1.0				1
	1.2	Sandy CLAY (CI): medium plasticity, pale grey, fine to coarse sand, trace fine gravel, w<PL, estimated very stiff (residual)		E	1.3	R2, S2			
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				
	2								2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased
TYPE OF BORING: 115mm diameter solid flight auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS: Coordinates are in GDA94 Zone 55K

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Cloncurry Camp Site - via Burke Developmental Road, Cloncurry

SURFACE LEVEL: --
EASTING: 446107
NORTHING: 7713221
DIP/AZIMUTH: 90°/--

BORE No: CLO-BH10
PROJECT No: 200446.01
DATE: 21/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.0	Gravelly Sandy CLAY (CL): low plasticity, red-brown, fine to coarse sand, fine to medium gravel, w<PL, estimated very stiff (residual)		E	0.0				
	0.3	Silty CLAY (CH): high plasticity, red-brown, with fine to medium sand, w<PL, estimated very stiff (residual)		E	0.3				
	1			E	0.5				
				E	0.8				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation		E	1.0				
					1.3				
					1.5				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased
TYPE OF BORING: 115mm diameter solid flight auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS: Coordinates are in GDA94 Zone 55K

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Cloncurry Camp Site - via Burke Developmental Road, Cloncurry

SURFACE LEVEL: --
EASTING: 446163
NORTHING: 7713277
DIP/AZIMUTH: 90°/--

BORE No: CLO-BH11
PROJECT No: 200446.01
DATE: 22/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.0								
	0.2	FILL Gravelly SAND (SP): fine to coarse, grey, fine to coarse gravel, dry, estimated dense		E	0.0				
		FILL Clayey SAND (SC): fine to coarse, grey, low plasticity clay, dry, estimated medium dense		E	0.2				
	0.5	Gravelly SAND (SP): fine to medium, pale grey, fine gravel, dry, estimated dense		E	0.5	R3, S3			
	0.8	Bore discontinued at 0.8m depth - Limit of investigation			0.7				
	1								
	2								
	3								
	4								
	5								

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased
TYPE OF BORING: 115mm diameter solid flight auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS: Coordinates are in GDA94 Zone 55K

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Cloncurry Camp Site - via Burke Developmental Road, Cloncurry

SURFACE LEVEL: --
EASTING: 446294
NORTHING: 7713269
DIP/AZIMUTH: 90°/--

BORE No: CLO-BH12
PROJECT No: 200446.01
DATE: 22/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Sandy CLAY (CL): low plasticity, red-brown, with fine to coarse sand, trace fine to coarse gravel, w<PL, very stiff and then hard (residual)		B	0.0				
				D	0.2				
				E	0.3				
				D	0.5				
				E					
				S			14, 19, 30/130mm		
	0.8			D	0.8				
	0.93			E	0.93				
	1.0				1.0				
	1.3	Sandy CLAY (CH): high plasticity, red-brown, fine to medium sand, trace fine gravel, w<PL, hard (residual)		D	1.3				
	1.5			E	1.5				
	1.55	GRANITE: red-brown, very low strength, highly weathered (Levian Granite)		S	1.55		15/50mm HB		
		Bore discontinued at 1.55m depth - Limit of investigation							

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Hughenden Camp Site - via Flinders Highway, Hughenden

SURFACE LEVEL: --
EASTING: 207816
NORTHING: 7690791
DIP/AZIMUTH: 90°/--

BORE No: HUG1-BH1
PROJECT No: 200446.01
DATE: 19/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm) 5 10 15 20
		Silty CLAY (CH): high plasticity, brown, trace fine to medium sand, w<PL, estimated stiff (residual)		E	0.0				
					0.2				
				E	0.3				
					0.5				
				E	0.8				
	1				1.0				1
	1.2	Silty CLAY (CH): high plasticity, pale grey mottled yellow-brown, trace fine to medium sand, w<PL, estimated very stiff (residual)		E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				
	2								2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Hughenden Camp Site - via Flinders Highway, Hughenden

SURFACE LEVEL: --
EASTING: 208068
NORTHING: 7690792
DIP/AZIMUTH: 90°/--

BORE No: HUG1-BH2
PROJECT No: 200446.01
DATE: 19/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Silty CLAY (CH): high plasticity, brown, trace fine to coarse sand, trace fine to medium gravel, w<PL, stiff (residual)		B	0.0				
	0.2			D	0.2				
	0.3			E	0.3				
	0.5			D	0.5				
	0.7			E	0.7				
	0.8			S	0.8		4,7,9 N = 16		
	0.95			D	0.95				
	1.0			E	1.0				
	1.2				1.2				
	1.3			D	1.3				
	1.5			E	1.5				
				S			10,14,17 N = 31		
	1.95	Bore discontinued at 1.95m depth - Limit of investigation			1.95				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Hughenden Camp Site - via Flinders Highway, Hughenden

SURFACE LEVEL: --
EASTING: 208301
NORTHING: 7690780
DIP/AZIMUTH: 90°/--

BORE No: HUG1-BH3
PROJECT No: 200446.01
DATE: 18/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0.0	Silty CLAY (CH): high plasticity, brown, with fine to medium gravel, trace fine to medium sand, w<PL, estimated stiff (residual)		E	0.0				
	0.2	- no trace gravel and sand, estimated very stiff			0.2				
	0.3			E	0.3				
	0.5				0.5				
	0.8			E	0.8				
	1.0				1.0				
	1.2	Gravelly Sandy CLAY (CI): medium plasticity, brown mottled pale brown, fine to coarse sand, fine gravel, w<PL, estimated very stiff (residual)		E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Hughenden Camp Site - via Flinders Highway, Hughenden

SURFACE LEVEL: --
EASTING: 208549
NORTHING: 7691027
DIP/AZIMUTH: 90°/--

BORE No: HUG2-BH1
PROJECT No: 200446.01
DATE: 17/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm) 5 10 15 20
		Silty CLAY (CH): high plasticity, brown, w<PL, estimated stiff (residual)		E	0.0				
					0.2				
				E	0.3				
					0.5				
				E	0.8				
	1				1.0				1
	1.2	Silty CLAY (CH): high plasticity, yellow-brown mottled brown, trace fine to medium sand, w<PL, estimated very stiff (residual)		E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				
	2								2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Hughenden Camp Site - via Flinders Highway, Hughenden

SURFACE LEVEL: --
EASTING: 208504
NORTHING: 7690976
DIP/AZIMUTH: 90°/--

BORE No: HUG2-BH2
PROJECT No: 200446.01
DATE: 17/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0.0	Silty CLAY (CH): high plasticity, brown, trace fine to coarse gravel, trace fine to medium sand, w<PL, estimated stiff (residual)		E	0.0				
	0.2				0.2				
	0.3			E	0.3				
	0.5				0.5				
	0.8			E	0.8	+R2 +S2			
	1.0				1.0				
	1.3			E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Hughenden Camp Site - via Flinders Highway, Hughenden

SURFACE LEVEL: --
EASTING: 208494
NORTHING: 7691080
DIP/AZIMUTH: 90°/--

BORE No: HUG2-BH3
PROJECT No: 200446.01
DATE: 17/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Silty CLAY (CH): high plasticity, brown trace fine sand, w<PL, stiff (residual)		D, E, B	0.0				
		- hard			0.2				
					0.3				
				E	0.4				
				D	0.5				
					0.6				
	0.8	Silty CLAY (CH): high plasticity, yellow-brown mottled pale brown and pale grey, w<PL, trace calcium carbonate lenses, hard (residual)			0.8				
				E	1.0				
				D					
				S	1.2		13,14,19 N = 33		
					1.3				
				E	1.45				
					1.5				
					2.5				
				S			7,19,27 N = 46		
					2.95				
	3.6	Silty CLAY (CH): high plasticity, yellow-brown mottled orange-brown and pale grey, trace fine sand, w<PL, hard (residual), extremely weathered mudstone with soil properties, with lenses of calcium carbonate and iron staining			4.0				
				S			13, 22, 30/130mm		
					4.43				
					5.5				
				S			16, 10/30mm (HB)		
	5.68	Bore discontinued at 5.68m depth - Limit of investigation			5.68				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Hughenden Camp Site - via Flinders Highway, Hughenden

SURFACE LEVEL: --
EASTING: 208430
NORTHING: 7690972
DIP/AZIMUTH: 90°/--

BORE No: HUG2-BH4
PROJECT No: 200446.01
DATE: 17/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water
	0.0	Silty CLAY (CH): high plasticity, brown, with medium to coarse gravel, w<PL, very stiff (residual)		D, E, B	0.0			
	0.2				0.2			
	0.3			E	0.3			
	0.5			D	0.5			
	0.8	- hard		E	0.8			
1	1.0	- very stiff			1.0			
	1.3			S	1.3		8,12,14 N = 26	
	1.45			E	1.45			
	1.5				1.5			
	1.8	Silty CLAY (CH): high plasticity, yellow-brown mottled pale brown and pale grey, w<PL, very stiff (residual)		D	1.8			
2	2.0				2.0			
	2.5	- extremely weathered mudstone with soil properties, with lenses of calcium carbonate and iron staining, hard		S	2.5		12,16,21 N = 37	
3	2.95				2.95			
	3.6	Silty CLAY (CH): high plasticity, yellow-brown mottled orange-brown and pale grey, trace fine to medium sand, w<PL, hard (residual), extremely weathered mudstone with soil properties, with lenses of calcium carbonate lenses and iron staining, hard						
4	4.0			S	4.0		12,18,23 N = 41	
	4.45				4.45			
5	5.5			S	5.5		17, 10/20mm (HB)	
	5.67	Bore discontinued at 5.67m depth - Limit of investigation			5.67			

Dynamic Penetrometer Test (blows per 100mm): 5, 10, 15, 20

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Hughenden Camp Site - via Flinders Highway, Hughenden

SURFACE LEVEL: --
EASTING: 208424
NORTHING: 7691124
DIP/AZIMUTH: 90°/--

BORE No: HUG2-BH5
PROJECT No: 200446.01
DATE: 18/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0.0	Silty CLAY (CH): high plasticity, brown, w<PL, estimated stiff (residual)		E	0.0				
	0.2				0.2				
	0.3			E	0.3				
	0.5				0.5				
	0.8			E	0.8				
	1.0				1.0				
	1.1	Silty CLAY (CH): high plasticity, yellow-brown mottled pale brown, w<PL, estimated stiff to very stiff (residual)		E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Hughenden Camp Site - via Flinders Highway, Hughenden

SURFACE LEVEL: --
EASTING: 208514
NORTHING: 7691160
DIP/AZIMUTH: 90°/--

BORE No: HUG2-BH6
PROJECT No: 200446.01
DATE: 17/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Silty CLAY (CH): high plasticity, brown, trace fine to medium sand, w<PL, stiff (residual)		D, E, B	0.0				
		- very stiff			0.2				
		- no trace sand			0.3	+R1 +S1			
				D E	0.5				
				S			6,13,16 N = 29		
					0.8				
	1			D E	0.95 1.0				1
	1.4	Silty CLAY (CH): high plasticity, yellow-brown mottled brown and pale grey, trace fine to medium sand, w<PL, hard (residual)			1.4				
				D	1.5				
				E	1.6				
				S	1.7		12,19,20 N = 39		
	1.95	Bore discontinued at 1.95m depth - Limit of investigation			1.95				
	2								2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Hughenden Camp Site - via Flinders Highway, Hughenden

SURFACE LEVEL: --
EASTING: 208587
NORTHING: 7691144
DIP/AZIMUTH: 90°/--

BORE No: HUG2-BH7
PROJECT No: 200446.01
DATE: 18/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0.0	Silty CLAY (CH): high plasticity, brown, trace fine to medium sand, w<PL, estimated stiff (residual)		E	0.0				
					0.2				
				E	0.3				
					0.5				
	0.9								
1		Silty CLAY (CL): low plasticity, brown and pale yellow-brown, with fine to medium gravel, w<PL, estimated stiff (residual)		E	1.0				1
	1.2	Silty CLAY (CH): high plasticity, yellow-brown, trace fine sand, w<PL, estimated stiff (residual)			1.2				
				E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				
2									2
3									3
4									4
5									5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Hughenden Camp Site - via Flinders Highway, Hughenden

SURFACE LEVEL: --
EASTING: 208647
NORTHING: 7691172
DIP/AZIMUTH: 90°/--

BORE No: HUG2-BH8
PROJECT No: 200446.01
DATE: 18/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0.0	Silty CLAY (CH): high plasticity, brown, w<PL, estimated stiff (residual)		E	0.0				
	0.2				0.2				
	0.3			E	0.3				
	0.5				0.5				
	0.7	Silty CLAY (CH): high plasticity, yellow-brown mottled pale brown, w<PL, estimated stiff to very stiff (residual)							
	0.8			E	0.8				
	1.0				1.0				
	1.3	- trace calcium carbonate nodules		E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Hughenden Camp Site - via Flinders Highway, Hughenden

SURFACE LEVEL: --
EASTING: 208717
NORTHING: 7691149
DIP/AZIMUTH: 90°/--

BORE No: HUG2-BH9
PROJECT No: 200446.01
DATE: 18/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0.0	Silty CLAY (CH): high plasticity, brown, trace fine to medium sand, w<PL, estimated stiff (residual)		E	0.0				
					0.2				
				E	0.3				
					0.5				
	0.8	Silty CLAY (CH): high plasticity, yellow-brown mottled pale brown, w<PL, estimated stiff to very stiff (residual)		E	0.8				
	1				1.0				1
		- trace calcium carbonate nodule		E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				
	2								2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Hughenden Camp Site - via Flinders Highway, Hughenden

SURFACE LEVEL: --
EASTING: 208638
NORTHING: 7691081
DIP/AZIMUTH: 90°/--

BORE No: HUG2-BH10
PROJECT No: 200446.01
DATE: 18/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Silty CLAY (CH): high plasticity, brown, trace fine to coarse sand, w<PL, stiff (residual)		D, E, B	0.0				
					0.2				
		- hard			0.3				
				D					
		- trace calcium carbonate nodules, very stiff		E	0.5				
				S	0.7		7,9,12 N = 21		
					0.8				
				D					
	1			E	0.95				1
					1.0				
					1.3				
				D					
	1.6			E	1.5				
		Silty CLAY (CH): high plasticity, brown mottled pale yellow-brown, trace fine to coarse sand, trace calcium carbonate nodules, hard (residual)		S			7,18,23 N = 41		
					1.8				
	1.95	Bore discontinued at 1.95m depth - Limit of investigation			1.95				
	2								2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Hughenden Camp Site - via Flinders Highway, Hughenden

SURFACE LEVEL: --
EASTING: 208582
NORTHING: 7690899
DIP/AZIMUTH: 90°/--

BORE No: HUG2-BH11
PROJECT No: 200446.01
DATE: 18/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0.0	Silty CLAY (CI): medium plasticity, brown, with fine to medium gravel, trace fine to medium sand, w<PL, estimated stiff (residual)		E	0.0				
	0.2				0.2				
	0.3			E	0.3				
	0.5				0.5				
	0.8			E	0.8				
	1.0				1.0				
	1.3			E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Hughenden Camp Site - via Flinders Highway, Hughenden

SURFACE LEVEL: --
EASTING: 208746
NORTHING: 7690809
DIP/AZIMUTH: 90°/--

BORE No: HUG2-BH12
PROJECT No: 200446.01
DATE: 18/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Silty CLAY (CH): high plasticity, brown, trace fine to coarse sand, trace fine gravel, w<PL, stiff (residual) - very stiff		D, E, B	0.0				
	0.2				0.2				
	0.3			D	0.3				
	0.5			E	0.5				
	0.8			S	0.8	+R3 +S3	8,11,13 N = 24		
	0.95			D	0.95				
	1.0			E	1.0				
	1.3			D	1.3				
	1.5			E	1.5				
	1.6	Silty CLAY (CH): high plasticity, brown mottled orange-brown, trace fine to coarse sand, trace fine gravel, w<PL, very stiff (residual)		S			7,12,16 N = 28		
	1.95	Bore discontinued at 1.95m depth - Limit of investigation			1.95				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in GDA94 Zone 55K

☒ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGLCPBJV
PROJECT: Copperstring 2032 Project
LOCATION: Julia Creek Camp Site

SURFACE LEVEL: --
EASTING: 576773
NORTHING: 7716396
DIP/AZIMUTH: 90°/--

BORE No: JULBH1
PROJECT No: 200446.01
DATE: 31/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Silty CLAY (CH): high plasticity, dark brown, trace fine to medium sand, w<PL, stiff (residual)		B	0.0				
				D					
	0.2			E	0.2				
		- hard		D	0.3				
	0.5			E	0.5				
		- very stiff							
	0.8			E	0.8				
	1.0				1.0				
				S			6,6,7 N = 13		
	1.3				1.3				
		Silty CLAY (CH): high plasticity, yellow-brown mottled pale grey, trace calcium carbonate, w<PL, stiff (residual)		D					
	1.45			E	1.45				
	1.5			U	1.5		pp >400		
	1.76				1.76				
		- extremely weathered mudstone with soil properties, with veins of ironstaining and calcium carbonate, very stiff							
	2.5			S	2.5		5,6,11 N = 17		
	2.95				2.95				
	4.0			S	4.0		6,9,15 N = 24		
	4.45				4.45				
	5.5			S	5.5		7,13,17 N = 30		
	5.95				5.95				
		Bore discontinued at 5.95m depth - Limit of investigation							

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGLCPBJV
PROJECT: Copperstring 2032 Project
LOCATION: Julia Creek Camp Site

SURFACE LEVEL: --
EASTING: 576821
NORTHING: 7716373
DIP/AZIMUTH: 90°/--

BORE No: JULBH2
PROJECT No: 200446.01
DATE: 1/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm) 5 10 15 20
	0.1	Silty CLAY (CH): high plasticity, dark brown, trace organics, w<PL, estimated firm (residual)		E	0.0				
		Silty CLAY (CH): high plasticity, pale brown, w<PL, estimated firm (residual)			0.1				
		- stiff		E	0.3				
	0.7	Silty CLAY (CH): high plasticity, yellow-brown mottled pale brown, w<PL, estimated stiff (residual)			0.5				
	1			E	0.8				1
		- veins of ironstaining and calcium carbonate			1.0				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation		E	1.3	R1, S1			
					1.5				
	2								2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGLCPBJV
PROJECT: Copperstring 2032 Project
LOCATION: Julia Creek Camp Site

SURFACE LEVEL: --
EASTING: 576780
NORTHING: 7716321
DIP/AZIMUTH: 90°/--

BORE No: JULBH3
PROJECT No: 200446.01
DATE: 1/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm) 5 10 15 20
	0.1	Silty CLAY (CH): high plasticity, dark brown, trace organics, w<PL, estimated firm (residual)		E	0.0				
		Silty CLAY (CH): high plasticity, brown, w<PL, estimated firm (residual)			0.1				
		- stiff		E	0.3				
		- w~PL			0.5				
				E	0.8				
	1				1.0				1
	1.2	Silty CLAY (CH): high plasticity, yellow-brown mottled pale brown, w~PL, estimated stiff (residual)		E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				
	2								2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGLCPBJV
PROJECT: Copperstring 2032 Project
LOCATION: Julia Creek Camp Site

SURFACE LEVEL: --
EASTING: 576726
NORTHING: 7716272
DIP/AZIMUTH: 90°/--

BORE No: JULBH4
PROJECT No: 200446.01
DATE: 1/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Silty CLAY (CH): high plasticity, brown, trace fine to coarse sand, trace fine to medium gravel, trace organics, w<PL, firm (residual)		B	0.0				
				D	0.2				
				E	0.3				
		- no organics, stiff		D					
				E	0.5				
		- very stiff		S			5,8,8 N = 16		
					0.8				
		- hard band		D					
	1			E	0.95				1
	1.2				1.0				
		Silty CLAY (CH): high plasticity, yellow-brown mottled pale grey, veins of calcium carbonate, w~PL, very stiff (residual)			1.3				
				D					
				E	1.5				
		- extremely weathered mudstone with soil properties, veins of ironstaining and calcium carbonate		S			4,9,10 N = 19		
	1.95				1.95				
	2	Bore discontinued at 1.95m depth - Limit of investigation							2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 1.5m, then 115mm solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGLCPBJV
PROJECT: Copperstring 2032 Project
LOCATION: Julia Creek Camp Site

SURFACE LEVEL: --
EASTING: 576789
NORTHING: 7716262
DIP/AZIMUTH: 90°/--

BORE No: JULBH5
PROJECT No: 200446.01
DATE: 1/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm) 5 10 15 20
	0.0	Silty CLAY (CH): high plasticity, dark brown, trace fine to medium sand, trace organics, w<PL, estimated firm (residual)		E	0.0				
	0.2	- no organics			0.2				
	0.3	- no sand		E	0.3				
	0.5	- stiff			0.5				
	0.8			E	0.8				
	1.0				1.0				
	1.3	Silty CLAY (CH): high plasticity, yellow-brown mottled pale brown, w~PL, estimated stiff (residual)		E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGLCPBJV
PROJECT: Copperstring 2032 Project
LOCATION: Julia Creek Camp Site

SURFACE LEVEL: --
EASTING: 576845
NORTHING: 7716301
DIP/AZIMUTH: 90°/--

BORE No: JULBH6
PROJECT No: 200446.01
DATE: 31/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Silty CLAY (CH): high plasticity, dark brown, trace fine to medium sand, w,PL, very stiff (residual)		B	0.0				
	0.2			D	0.2				
	0.3	- hard		E	0.3				
	0.5			D	0.5				
	0.8	- stiff to very stiff		E	0.8				
1	1.0				1.0				1
	1.3			S	1.3		6,7,7 N = 14		
	1.3	Silty CLAY (CH): high plasticity, yellow-brown mottled pale grey, bands of calcite interbedded, w<PL, very stiff (residual)		D	1.3				
	1.45			E	1.45				
	1.5			U	1.5		pp >400		
	1.64	- extremely weathered mudstone with soil properties, with veins of ironstaining and calcium carbonate			1.64				
2	2.5			S	2.5		5,7,11 N = 18		2
	2.95				2.95				
3	4.0			S	4.0		6,8,10 N = 18		3
	4.45				4.45				
4	5.5	- hard		S	5.5		7,11,19 N = 30		4
5	5.95				5.95				5

Bore discontinued at 5.95m depth - Limit of investigation

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGLCPBJV
PROJECT: Copperstring 2032 Project
LOCATION: Julia Creek Camp Site

SURFACE LEVEL: --
EASTING: 576868
NORTHING: 7716389
DIP/AZIMUTH: 90°/--

BORE No: JULBH7
PROJECT No: 200446.01
DATE: 1/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm) 5 10 15 20
		Silty CLAY (CH): high plasticity, dark brown, trace organics, w<PL, estimated firm (residual)		E	0.0				
		- no organics			0.2				
				E	0.3				
					0.6				
	0.7	Silty CLAY (CH): high plasticity, yellow-brown mottled pale brown, w~PL, estimated stiff (residual)		E	0.8				
	1				1.0				1
		- veins of calcium carbonate		E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				
	2								2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGLCPBJV
PROJECT: Copperstring 2032 Project
LOCATION: Julia Creek Camp Site

SURFACE LEVEL: --
EASTING: 576907
NORTHING: 7716264
DIP/AZIMUTH: 90°/--

BORE No: JULBH8
PROJECT No: 200446.01
DATE: 31/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm) 5 10 15 20
		Silty CLAY (CH): high plasticity, dark brown, w<PL, estimated stiff (residual)		E	0.0				
					0.2				
				E	0.3				
					0.5				
	0.8	Silty CLAY (CH): high plasticity, yellow-brown mottled pale grey, w<PL, estimated stiff (residual)		E	0.8				
	1				1.0				1
				E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				
	2								2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGLCPBJV
PROJECT: Copperstring 2032 Project
LOCATION: Julia Creek Camp Site

SURFACE LEVEL: --
EASTING: 576949
NORTHING: 7716342
DIP/AZIMUTH: 90°/--

BORE No: JULBH9
PROJECT No: 200446.01
DATE: 1/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Silty CLAY (CH): high plasticity, brown, trace fine to medium sand, trace fine to medium gravel, trace organics, w<PL, stiff (residual)		E	0.0				
	0.1			B	0.1				
	0.2			D	0.2				
	0.3	- no organics, sand or gravel		D	0.3				
	0.5			E	0.5				
	0.8	- very stiff		S	0.8		5,7,8 N = 15		
1	0.95			D	0.95				1
	1.0			E	1.0				
	1.3	Silty CLAY (CH): high plasticity, yellow-brown mottled pale brown, w~PL, very stiff		D	1.3				
	1.5			E	1.5				
		- extremely weathered mudstone with soil properties, veins of ironstaining and calcium carbonate		S			4,8,10 N = 18		
2	1.95	Bore discontinued at 1.95m depth - Limit of investigation			1.95				2
3									3
4									4
5									5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 1.5m, then 115mm solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGLCPBJV
PROJECT: Copperstring 2032 Project
LOCATION: Julia Creek Camp Site

SURFACE LEVEL: --
EASTING: 577017
NORTHING: 7716215
DIP/AZIMUTH: 90°/--

BORE No: JULBH10
PROJECT No: 200446.01
DATE: 31/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm) 5 10 15 20
	0.1	FILL Sandy GRAVEL (GP): fine to medium, dark brown, with fine to medium sand, dry, estimated medium dense		E	0.0				
				E	0.1				
		Silty CLAY (CH): high plasticity, dark brown, trace fine to medium sand, w<PL, estimated stiff (residual)			0.2				
				E	0.3				
					0.5				
	1			E	0.8				1
					1.0				
	1.2	Silty CLAY (CH): high plasticity, yellow-brown mottled pale grey, w<PL, estimated stiff (residual)		E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				
	2								2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGLCPBJV
PROJECT: Copperstring 2032 Project
LOCATION: Julia Creek Camp Site

SURFACE LEVEL: --
EASTING: 576975
NORTHING: 7716202
DIP/AZIMUTH: 90°/--

BORE No: JULBH11
PROJECT No: 200446.01
DATE: 31/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Silty CLAY (CH): high plasticity,y dark brown, trace fine to medium sand, w<PL, stiff (residual)		B	0.0				
				D					
	0.2	- very stiff		E	0.2				
	0.3			D	0.3				
				E					
	0.5				0.5				
	0.8			E	0.8				
1	1.0			D	1.0				1
	1.1	Silty CLAY (CH): high plasticity, yellow-brown mottled pale grey, w<PL, very stiff (residual)		S	1.2		6,9,9 N = 18		
	1.3				1.3				
	1.45			E	1.45				
	1.8	- extremely weathered mudstone with soil properties, veins of ironstaining and calcium carbonate			1.8				
2									2
	2.5			S	2.5		5,6,12 N = 18		
	2.95				2.95				
3									3
	4.0			S	4.0		5,8,12 N = 20		
	4.45				4.45				
4									4
	5.5			S	5.5		7,12,15 N = 27		
5									5
	5.95				5.95				

Bore discontinued at 5.95m depth - Limit of investigation

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGLCPBJV
PROJECT: Copperstring 2032 Project
LOCATION: Julia Creek Camp Site

SURFACE LEVEL: --
EASTING: 576803
NORTHING: 771619
DIP/AZIMUTH: 90°/--

BORE No: JULBH12
PROJECT No: 200446.01
DATE: 1/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.0	Sandy CLAY (CI): medium plasticity, yellow-brown mottled brown, fine to coarse sand, with fine gravel, w<PL - no organics, sand or gravel		B D E	0.0 0.2 0.3				
	0.4	Silty CLAY (CH): high plasticity, yellow-brown mottled brown, trace fine to coarse sand and gravel, trace organics, w<PL, stiff (residual)		D E	0.5				
	1			S	0.8		5,6,7 N = 13		1
				D E	0.95 1.0				
	1.2	Silty CLAY (CH): high plasticity, yellow-brown mottled pale brown, w~PL, very stiff (residual) - extremely weathered mudstone with soil properties, veins of ironstaining and calcium carbonate		D E	1.3 1.5				
				S			5,6,10 N = 16		
	1.95 2	Bore discontinued at 1.95m depth - Limit of investigation			1.95				2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 1.5m, then 115mm solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Pentland Camp Site

SURFACE LEVEL: --
EASTING: 334443
NORTHING: 7728659
DIP/AZIMUTH: 90°/--

BORE No: PENBH1
PROJECT No: 200446.01
DATE: 4/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Silty SAND (SM): fine to medium, dark brown, with fine to coarse gravel, trace organics, trace low plasticity clay, dry, dense (alluvial)		B	0.0				
				D	0.2				
	0.3	- no organics		E	0.3				
		Gravelly SAND (SP): fine to coarse, brown, fine to coarse gravel, trace low plasticity clay, dry, very dense (alluvial)		D					
				E	0.5				
	0.8	Sandy CLAY (CI): medium plasticity, red-brown, fine to coarse sand, with fine to coarse gravel, w<PL, very stiff (residual)		E	0.8				
1					1.0				1
	1.2	Sandy CLAY (CI): medium plasticity, pale brown mottled yellow-brown, fine to coarse sand, trace mica, w<PL, very stiff (residual)		S	1.2		6,13,19 N = 32		
				D	1.3				
				E	1.45				
					1.5				
2									2
	2.5	SANDSTONE: fine to coarse grained, pale brown mottled yellow-brown, very low strength, extremely weathered (Campaspe Formation)		S	2.5		13/60mm HB		
					2.56				
3									3
	3.82	Bore discontinued at 3.82m depth - Auger refusal on sandstone		S	3.8		10/20mm HB		
					3.82				
4									4
5									5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Pentland Camp Site

SURFACE LEVEL: --
EASTING: 334386
NORTHING: 7728674
DIP/AZIMUTH: 90°/--

BORE No: PENBH2
PROJECT No: 200446.01
DATE: 4/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0.0	Silty SAND (SM): fine to medium, dark brown, trace low plasticity clay, trace organics, dry, estimated medium dense (alluvial)		E	0.0				
	0.2	- no organics			0.2				
	0.3			E	0.3				
	0.5				0.5				
	0.6	Gravelly SAND (SP): fine to coarse, red-brown, fine to medium gravel, trace low plasticity clay, dry, estimated dense (alluvial)							
	0.8			E	0.8				
	1.0				1.0				
	1.3	Sandy CLAY (CH): high plasticity, red-brown mottled yellow-brown, fine to medium sand, w<PL, estimated very stiff (residual)		E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Pentland Camp Site

SURFACE LEVEL: --
EASTING: 334438
NORTHING: 7728727
DIP/AZIMUTH: 90°/--

BORE No: PENBH3
PROJECT No: 200446.01
DATE: 3/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm) 5 10 15 20
		Silty SAND (SM): fine to coarse, dark brown, trace fine to medium gravel, trace organics, dry, estimated medium dense (alluvial)		E	0.0				
	0.2				0.2				
	0.3	- no organics		E	0.3				
		Gravelly SAND (SP): fine to coarse, dark brown, fine to coarse gravel, dry, estimated medium dense (alluvial)			0.5				
	0.8	Sandy CLAY (CI): medium plasticity, pale brown mottled yellow-brown, fine to coarse sand, trace fine to medium gravel, w<PL, estimated hard (Residual)		E	0.8				
	1				1.0				1
				E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				
	2								2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Pentland Camp Site

SURFACE LEVEL: --
EASTING: 334323
NORTHING: 7728708
DIP/AZIMUTH: 90°/--

BORE No: PENBH4
PROJECT No: 200446.01
DATE: 4/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Silty SAND (SM): fine to medium, red-brown, trace fine to medium gravel, trace organics, trace low plasticity clay, dry, dense (alluvial)		B	0.0				
				D	0.2				
	0.3	- no organics		E	0.3				
		Gravelly SAND (SP): fine to coarse, red-brown, fin to medium gravel, trace low plasticity clay, dry, dense (alluvial)		D					
				E	0.5				
		- with cobbles			0.8				
1				E	1.0				1
	1.2			S	1.2		15,18,20 N = 38		
		Sandy CLAY (CI): medium plasticity, red-brown, fine to medium sand, with fine to coarse gravel, w<PL, hard (residual)		D	1.3				
				E	1.4				
					1.45				
					1.5				
2									2
					2.5				
	2.6	Clayey SAND (SC): fine to medium, pale brown, low plasticity clay, trace calcite, trace mica, dry, dense (residual)		S	2.6		9, 13/60mm HB		
				D	2.71				
					2.8				
3									3
4	4.0	SANDSTONE: fine to coarse grained, pale brown, very low strength, extremely weathered (Campaspe Formation)		S	4.0		10/80mm HB		4
					4.06				
5									5
	5.51	Bore discontinued at 5.51m depth - SPT refusal		S	5.5		7/10mm HB		
					5.51				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Pentland Camp Site

SURFACE LEVEL: --
EASTING: 334383
NORTHING: 7728775
DIP/AZIMUTH: 90°/--

BORE No: PENBH5
PROJECT No: 200446.01
DATE: 3/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm) 5 10 15 20
	0.0	Gravelly SAND (SP): fine to coarse, dark brown, fine to coarse gravel, trace low plasticity clay, trace organics, dry, estimated medium dense (alluvial)		E	0.0				
	0.2	- no organics			0.2				
	0.3			E	0.3				
	0.5				0.5				
	0.7	Sandy CLAY (CL): low plasticity, red-brown, fine to coarse sand, trace fine to coarse gravel, w<PL, estimated very stiff (residual)							
	0.8			E	0.8				
1	1.0				1.0				1
	1.3	Sandy CLAY (CL): low plasticity, pale brown mottled yellow-brown, fine to coarse sand, trace fine gravel, w<PL, estimated very stiff (residual)		E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				
2									2
3									3
4									4
5									5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Pentland Camp Site

SURFACE LEVEL: --
EASTING: 334472
NORTHING: 7728787
DIP/AZIMUTH: 90°/--

BORE No: PENBH6
PROJECT No: 200446.01
DATE: 3/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.1	Gravelly SAND (SP): fine to medium, dark brown, fine to medium gravel, trace low plasticity clay, trace organics, dry, very dense		B D E	0.0 0.1				
		Sandy CLAY (CI): medium plasticity, red-brown, fine to coarse sand, with fine to medium gravel, w<PL, hard (residual)		D E	0.3				
	0.5	Gravelly Sandy CLAY (CL): low plasticity, red-brown, fine to coarse sand, fine to coarse quartz gravel, w<PL, hard (residual)		S	0.5 0.69		20, 30/140mm		
	1.0	Gravelly Clayey SAND (SC): red-brown, fine to coarse sand, fine to coarse quartz gravel, medium plasticity fines, dense (residual)		D E	0.8 1.0				
				D E	1.3 1.5				
				S			13, 18, 30/140mm		
	1.8	Gravelly Sandy CLAY (CL): low plasticity, pale brown mottled red-brown, fine to coarse sand, fine to coarse quartz gravel, w<PL, hard (residual)							
	1.94	Bore discontinued at 1.94m depth - Limit of investigation			1.94				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 1.5m, then 115mm diameter sollid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Pentland Camp Site

SURFACE LEVEL: --
EASTING: 334529
NORTHING: 7728704
DIP/AZIMUTH: 90°/--

BORE No: PENBH7
PROJECT No: 200446.01
DATE: 4/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0.1	Gravelly SAND (SP): fine to coarse, dark brown, fine to medium gravel, trace low plasticity clay, trace organics, dry, estimated medium dense		E	0.0				
	0.2			E	0.1				
		Gravelly SAND (SP): fine to coarse, pale grey, fine gravel, dry, estimated very dense (residual)			0.2				
		Bore discontinued at 0.2m depth - Auger refusal due to probable rock							

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Pentland Camp Site

SURFACE LEVEL: --
EASTING: 334597
NORTHING: 7728681
DIP/AZIMUTH: 90°/--

BORE No: PENBH8
PROJECT No: 200446.01
DATE: 3/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0.0	Gravelly Sandy CLAY (CI): medium plasticity, red-brown, fine to coarse sand, fine to coarse gravel, trace organics, w<PL, estimated stiff (residual)		E	0.0				
	0.2				0.2				
	0.3	Sandy CLAY (CH): high plasticity, red-brown, fine to coarse sand, w<PL, estimated stiff (residual)		E	0.3				
	0.5				0.5				
	0.8	Sandy CLAY (CH): high plasticity, pale brown mottled yellow-brown, fine to coarse sand, w<PL, estimated stiff (residual)		E	0.8				
	1.0				1.0				
	1.3			E	1.3	R2, S2			
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				

5 10 15 20

1 2 3 4 5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Pentland Camp Site

SURFACE LEVEL: --
EASTING: 334647
NORTHING: 7728628
DIP/AZIMUTH: 90°/--

BORE No: PENBH9
PROJECT No: 200446.01
DATE: 3/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0.0	Sandy CLAY (CI): medium plasticity, dark brown, fine to medium sand, trace fine gravel, trace organics, w<PL, estimated stiff (residual)		E	0.0				
	0.2				0.2				
	0.3	Sandy CLAY (CI): medium plasticity, red-brown, fine to coarse sand, trace fine to coarse gravel, w<PL, estimated very stiff (residual)		E	0.3				
	0.5				0.5				
	0.7	Gravelly Sandy CLAY (CH): high plasticity, pale brown mottled yellow-brown, fine to coarse sand, fine to medium gravel, w<PL, estimated very stiff (residual)		E	0.8				
	1.0				1.0				
	1.1	Sandy CLAY (CI): medium plasticity, pale brown mottled yellow-brown, fine to coarse sand, w<PL, estimated very stiff (residual)		E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Pentland Camp Site

SURFACE LEVEL: --
EASTING: 334646
NORTHING: 7728538
DIP/AZIMUTH: 90°/--

BORE No: PENBH10
PROJECT No: 200446.01
DATE: 3/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Silty SAND (SM): fine to medium, dark brown, with fine to coarse gravel, trace low plasticity clay, trace organics, medium dense, dry (alluvial)		B	0.0				
				D	0.2				
	0.3	- dense		E	0.3				
		Gravelly SAND (SP): fine to medium, red-brown, fine to coarse quartz gravel, trace low plasticity clay, dry, dense (alluvial)		D					
				E	0.5				
				S			15,23,22 N = 45		
				D	0.8				
	1			E	0.95				1
					1.0				
	1.3				1.3				
	1.4	Sandy CLAY (CI): medium plasticity, dark red-brown, fine to medium sand, trace mica, w<PL, very stiff (residual)		D					
				E	1.5				
		Sandy CLAY (CI): medium plasticity, red-brown mottled pale grey, fine to medium sand, trace mica, w<PL, very stiff (residual)		S			14,24,18 N = 42		
	1.95				1.95				
	2	Bore discontinued at 1.95m depth - Limit of investigation							2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 1.5m, then 115mm diameter sollid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Pentland Camp Site

SURFACE LEVEL: --
EASTING: 334741
NORTHING: 7728594
DIP/AZIMUTH: 90°/--

BORE No: PENBH11
PROJECT No: 200446.01
DATE: 3/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0.0	Sandy CLAY (CH): high plasticity, red-brown, fine to medium sand, trace organics, w<PL, estimated stiff (residual)		E	0.0				
	0.2				0.2				
	0.3	Sandy CLAY (CH): high plasticity, pale brown, fine to medium sand, trace mica, w<PL, estimated stiff (residual)		E	0.3				
	0.5				0.5				
	0.8	Sandy CLAY (CH): high plasticity, yellow-brown mottled pale brown, fine to medium sand, w<PL, estimated very stiff (residual)		E	0.8				
	1.0				1.0				
	1.3			E	1.3				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation			1.5				

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Pentland Camp Site

SURFACE LEVEL: --
EASTING: 334820
NORTHING: 7728555
DIP/AZIMUTH: 90°/--

BORE No: PENBH12
PROJECT No: 200446.01
DATE: 3/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	Gravelly Sandy CLAY (CL): low plasticity, dark brown, fine to coarse sand, fine to coarse gravel, trace organics, w<PL, hard (residual)		B	0.0				
				D	0.2				
	0.3	Sandy CLAY (CI): medium plasticity, dark brown, fine to coarse sand, trace fine to medium gravel, w<PL, very stiff (residual)		D	0.3				
				E	0.5				
	0.6	Clayey SAND (SC): fine to coarse, pale brown and dark brown, high plasticity fines, trace mica, medium dense (residual)		S			6,6,10 N = 16		
	1			D	0.8				1
				E	0.95				
					1.0				
				D	1.3				
		- dense		E	1.5				
				S			15, 18, 20/120mm HB		
	1.92	Bore discontinued at 1.92m depth - Limit of investigation			1.92				
	2								2
	3								3
	4								4
	5								5

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger to 1.5m, then 115mm diameter sollid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Richmond Camp Site - via Macgoffin Street, Richmond

SURFACE LEVEL: --
EASTING: 722238
NORTHING: 7706796
DIP/AZIMUTH: 90°/--

BORE No: RIC-BH 1
PROJECT No: 200446.01
DATE: 20/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.3	FILL Gravelly Sandy CLAY (CH): high plasticity, pale brown and dark brown, fine to medium sand, medium to coarse gravel, w<PL, apparently well compacted		D E	0.2 0.3				
		CLAY (CH): high plasticity, pale brown and dark brown, trace fine to medium sand, w<PL, hard (residual)		B D E	0.5 0.7	R2, S2			
		- pale brown		U	0.77				
	1			D E	1.0				
				S			11,16,15 N = 31		
				D E	1.45 1.5				
	2			D	2.0				
				D	2.5				
				S			11,23,25 N = 48		
	3				2.95				
				U	3.0 3.25				
	4	- relict rock structure observable		S	4.0		19, 22, 30/130mm		
					4.43				
	5				5.5				
				S			15, 28, 30/120mm		
	5.92	Bore discontinued at 5.92m depth - Limit of investigation			5.92				
	6								

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in MGDA94 Zone 54K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Richmond Camp Site - via Macgoffin Street, Richmond

SURFACE LEVEL: --
EASTING: 722175
NORTHING: 7706853
DIP/AZIMUTH: 90°/--

BORE No: RIC-BH 2
PROJECT No: 200446.01
DATE: 21/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0.3	FILL Gravelly Sandy CLAY (CH): high plasticity, pale brown and dark brown, fine to medium sand, fine to medium gravel, w<PL		E	0.2				
		CLAY (CH): high plasticity, pale brown and dark brown, trace fine to medium sand, w<PL, estimated very stiff (residual)		E	0.5				
	1	- pale brown		E	1.0				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation		E	1.5				

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in MGDA94 Zone 54K

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Richmond Camp Site - via Macgoffin Street, Richmond

SURFACE LEVEL: --
EASTING: 722221
NORTHING: 7706877
DIP/AZIMUTH: 90°/--

BORE No: RIC-BH 3
PROJECT No: 200446.01
DATE: 21/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0	CLAY (CH): high plasticity, dark brown, trace fine to medium sand, trace fine to medium gravel, w<PL, estimated very stiff (residual)		E	0.2				
				E	0.5				
		- pale brown							
	1			E	1.0				1
	1.5	Bore discontinued at 1.5m depth - Limit of investigation		E	1.5				
	2								2
	3								3
	4								4
	5								5
	6								6

Dynamic Penetrometer Test (blows per 0mm): 5, 10, 15, 20

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in MGDA94 Zone 54K

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Richmond Camp Site - via Macgoffin Street, Richmond

SURFACE LEVEL: --
EASTING: 722153
NORTHING: 7706918
DIP/AZIMUTH: 90°/--

BORE No: RIC-BH 4
PROJECT No: 200446.01
DATE: 20/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	FILL CLAY (CH): high plasticity, dark brown and pale brown, trace fine to medium sand, trace fine to medium gravel, w<PL, apparently well compacted		D	0.1				
				E	0.2				
				B					
	0.5	CLAY (CH): high plasticity, pale brown, trace fine to medium sand, w<PL, very stiff (residual)		D	0.5				
				E	0.6				
				U	0.62				
	1	- pale brown with orange-brown streaks		D	1.0				
				S			6,7,9 N = 16		
				E	1.45				
				U	1.5				
					1.59				
	2			S	2.5		7,12,17 N = 29		
	3				2.95				
				U	3.0				
		- pale grey-brown and orange-brown, hard			3.44				
	4			S	4.0		8,13,18 N = 31		
					4.45				
	5	- with relict rock structure		S	5.5		15,20,30 N = 50		
	5.95	Bore discontinued at 5.95m depth - Limit of investigation			5.95				
	6								

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in MGDA94 Zone 54K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Richmond Camp Site - via Macgoffin Street, Richmond

SURFACE LEVEL: --
EASTING: 722122
NORTHING: 7706967
DIP/AZIMUTH: 90°/--

BORE No: RIC-BH 5
PROJECT No: 200446.01
DATE: 20/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0				0.0				
	0.1	FILL Sandy CLAY (CH): high plasticity, dark brown and pale brown, fine to medium sand, w<PL			0.1				
		FILL CLAY (CH): high plasticity, pale brown, trace fine to medium sand, trace fine to medium gravel, w<PL, apparently well compacted		D E D B E S	0.2 0.5 0.6		8, 14, 15/10mm		
	0.8	CLAY (CH): high plasticity, pale grey and brown, with fine to coarse sand, w<PL, very stiff (residual)		E	0.81 1.0				
		- pale brown and grey-brown with orange-brown streaks		D E S	1.5		8,9,10 N = 19		
	1.95	Bore discontinued at 1.95m depth - Limit of investigation			1.95				

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in MGDA94 Zone 54K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Richmond Camp Site - via Macgoffin Street, Richmond

SURFACE LEVEL: --
EASTING: 722079
NORTHING: 7707027
DIP/AZIMUTH: 90°/--

BORE No: RIC-BH 6
PROJECT No: 200446.01
DATE: 21/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0.2	FILL Gravelly Sandy CLAY (CH): high plasticity, dark brown, fine to coarse sand, fine to medium gravel, w<PL		E	0.2				
		CLAY (CH): high plasticity, pale brown and dark brown, trace fine to medium sand, w~PL, estimated very stiff (residual)		E	0.5				
	1			E	1.0				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation		E	1.5				

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in MGDA94 Zone 54K

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Richmond Camp Site - via Macgoffin Street, Richmond

SURFACE LEVEL: --
EASTING: 722128
NORTHING: 7706800
DIP/AZIMUTH: 90°/--

BORE No: RIC-BH 7
PROJECT No: 200446.01
DATE: 21/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0	CLAY (CH): high plasticity, dark brown, trace fine to medium sand, w<PL, estimated very stiff (residual)		E	0.2				
				E	0.5				
		- pale grey							
	1			E	1.0				1
	1.5	Bore discontinued at 1.5m depth - Limit of investigation		E	1.5				
	2								2
	3								3
	4								4
	5								5
	6								6

Dynamic Penetrometer Test (blows per 0mm): 5, 10, 15, 20

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in MGDA94 Zone 54K

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Richmond Camp Site - via Macgoffin Street, Richmond

SURFACE LEVEL: --
EASTING: 722122
NORTHING: 7706967
DIP/AZIMUTH: 90°/--

BORE No: RIC-BH 8
PROJECT No: 200446.01
DATE: 20/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	FILL CLAY (CH): high plasticity, dark brown and pale grey, trace fine to medium sand and fine gravel, w>PL, apparently well compacted		D	0.0				
				E	0.1				
				D	0.2				
				B	0.5				
				E	0.6				
	0.7	CLAY (CH): high plasticity, dark brown and pale brown, trace fine to medium sand, w<PL, very stiff (residual)		S			7,12,13 N = 25		
				D	0.8				
	1			B	0.95				1
				E	1.0				
				D	1.2				
		- pale brown		E	1.5				
				S			6,11,14 N = 25		
	1.95	Bore discontinued at 1.95m depth - Limit of investigation			1.95				
	2								2
	3								3
	4								4
	5								5
	6								6

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in MGDA94 Zone 54K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Richmond Camp Site - via Macgoffin Street, Richmond

SURFACE LEVEL: --
EASTING: 722041
NORTHING: 7706937
DIP/AZIMUTH: 90°/--

BORE No: RIC-BH 9
PROJECT No: 200446.01
DATE: 21/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0	CLAY (CH): high plasticity, dark brown and pale brown, trace fine to medium sand, w<PL, estimated very stiff (residual)		E	0.2				
				E	0.5				
		- pale brown							
	1			E	1.0				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation		E	1.5				
	2								
	3								
	4								
	5								
	6								

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** Uncased
TYPE OF BORING: 115mm diameter solid flight auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS: Coordinates are in MGDA94 Zone 54K

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Richmond Camp Site - via Macgoffin Street, Richmond

SURFACE LEVEL: --
EASTING: 72204
NORTHING: 7706983
DIP/AZIMUTH: 90°/--

BORE No: RIC-BH10
PROJECT No: 200446.01
DATE: 21/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0	CLAY (CH): high plasticity, dark brown and pale brown, trace fine to medium sand, w<PL, estimated very stiff (residual)		E	0.2				
				E	0.5				
	1	- pale brown		E	1.0				
	1.5	Bore discontinued at 1.5m depth - Limit of investigation		E	1.5				
	2								
	3								
	4								
	5								
	6								

Dynamic Penetrometer Test (blows per 0mm): 5, 10, 15, 20

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in MGDA94 Zone 54K

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Richmond Camp Site - via Macgoffin Street, Richmond

SURFACE LEVEL: --
EASTING: 722180
NORTHING: 7706693
DIP/AZIMUTH: 90°/--

BORE No: RIC-BH11
PROJECT No: 200446.01
DATE: 21/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 0mm)
	0.0	FILL Gravelly Sandy CLAY (CH): high plasticity, dark brown and pale brown, fine to coarse sand, fine to medium gravel, w<PL, apparently well compacted		E	0.2				
				E	0.5				
	0.8	CLAY (CH): high plasticity, pale grey, with fine to coarse sand, with fine to coarse gravel, w<PL, estimated very stiff (residual)		E	1.0				
	1.5	Bore discontinued at 1.5m dpeth - Limit of investigation		E	1.5				

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in MGDA94 Zone 54K

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Richmond Camp Site - via Macgoffin Street, Richmond

SURFACE LEVEL: --
EASTING: 722193
NORTHING: 7706607
DIP/AZIMUTH: 90°/--

BORE No: RIC-BH12
PROJECT No: 200446.01
DATE: 20/10/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.2	FILL Gravelly Sandy CLAY (CH): high plasticity, pale grey, trace fine to medium sand, trace fine to medium gravel, w<PL, apparently well compacted		D	0.0				
		Sandy CLAY (CH): high plasticity, pale brown and dark grey, trace fine to medium sand, w<PL, hard (residual)		E	0.2				
				D					
				E	0.5		12,20,17 N = 37		
				S					
				D					
	1	- pale brown		E	0.95 1.0				
				D					
		- very stiff		E	1.5				
				S			7,13,16 N = 29		
	1.95	Bore discontinued at 1.95m depth - Limit of investigation			1.95				

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** Uncased

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Coordinates are in MGDA94 Zone 54K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Between Woodstock and Mt Isa

SURFACE LEVEL: --
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: MIS-BH27-H1
PROJECT No: 200446.01
DATE: 29/11/2023
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	0.3	FILL Gravelly Sandy CLAY (CI): medium plasticity, brown, fine to medium sand, fine to medium gravel, trace organics, w<PL, stiff - no organics							B D E D E D E			
	1.0	Silty Sandy CLAY (CI): medium plasticity, red-brown, fine to medium sand, with fine to medium gravel, w<PL							S			5, 20, 18/50mm HB
		Silty Sandy CLAY (CI): medium plasticity, pale grey mottled red-brown, fine to medium sand, with fine to medium gravel, w<PL, hard (residual)							E D			
	2.5	SILTSTONE: fine grained, dark grey and grey, very low strength, extremely weathered, with soil properties							S			6/75mm HB
		- hard band (~1200mm), with interbedded clay seam, purple streaks							S			12/50mm HB
		- hard band, interbedded clay seam							S			30/100mm
									S			20/70mm HB
									S			30/130mm
	10.0											

DRAFT

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** HWT to 2.5m
TYPE OF BORING: 115mm diameter solid flight auger to 2.5m, washbore to 10m, NMLC to 11.5m, then washbore
WATER OBSERVATIONS: No free groundwater observed while augering
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Between Woodstock and Mt Isa

SURFACE LEVEL: --
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: MIS-BH27-H1
PROJECT No: 200446.01
DATE: 29/11/2023
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		MUDSTONE: fine grained, grey, very low strength, extremely weathered, fragmented										30/120mm
		- grey mottled red-brown, medium strength, moderately weathered, highly fractured, with folliations and ironstaining						10.25m: J, 0°, cu, ro, vr, crushed stone 10.32m: J, 0°, ir, ro, vr, crushed, stone 10.42m: J, 0°, cu, sm, cln	C S	100	38	
	11	- grey and yellow-brown, low strength, highly to extremely weathered						10.56m: H, 10°, ir, ro, vr, crushed stone	C	85	0	
									S			30/140mm
	12											
	13								S			30/140mm
	14											
	15								S			26/110mm HB
	15.0	Bore discontinued at 15.0m depth - Limit of investigation										
	16											
	17											
	18											
	19											

DRAFT

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** HWT to 2.5m

TYPE OF BORING: 115mm diameter solid flight auger to 2.5m, washbore to 10m, NMLC to 11.5m, then washbore

WATER OBSERVATIONS: No free groundwater observed while augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Between Woodstock and Mt Isa

SURFACE LEVEL: --
EASTING: 342777
NORTHING: 7702238
DIP/AZIMUTH: 90°/--

BORE No: MIS-BH5-H1
PROJECT No: 200446.01
DATE: 30/11/2023
SHEET 1 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	0.05	FILL Sandy CLAY (CL): low plasticity, brown, fine to medium sand, with organics, trace fine to medium gravel, w<PL, very stiff							B D E D			
		Silty CLAY (CH): high plasticity, red-brown, w<PL, hard (residual)							D			
	1	- trace fine gravel - no gravel - with fine to medium sand							S D			19,25,26 N = 51
	2											
	2.2	Gravelly Sandy CLAY (CL-Cl): low to medium plasticity, grey mottled red-brown, fine to coarse sand, fine to medium gravel, w<PL, hard (residual)							S			28, 16/40mm HB
	3											
	3.8	SCHIST: fine grained, grey, high strength, slightly weathered, with healed joints and ironstained veins, fractured							S			10/30mm HB
	4	- medium strength						3.91m: J, 15°, ir, ro, cly, ven 4.05m: J, 20°, ir, ro, cln 4.08m: 4.08-4.11: Cz, 5-60°, ir, ro, fe, stn 4.081m: 4.08-4.16: J x 2, 60°, pl, ro, fe, stn, at 0.01m spacing 4.12m: J, 10°, ir, ro, fe, stn 4.13m: J, 15°, ir, ro, fe, stn 4.14m: 4.14-4.29: J, 80°, pl, sm, cln 4.28m: J, 10°, ir, ro, cly, ven 4.3m: J, 10-20°, ir, ro, cly, ven 4.47m: J, 30°, ir, ro, cln 4.49m: J, 30°, pl, ro, cly, ven 4.51m: J, 5°, pl, sm, cln 4.52m: J, 5°, pl, sm, cln 4.64m: 4.64-4.72: J x 3, 40°, pl, sm, cln, at 0.01m spacing 4.98m: J, 40°, pl, sm, cln 5m: 5.00-5.30: J x 10, 40-70°, pl, sm, cly, ven, at 0.01-0.09m spacing 5.3m: 5.30-5.36: J x 4, 80°, pl, sm, fe, stn, at 0.01m spacing 6.04m: J, 40°, pl, sm, cln 6.08m: J, 60°, pl, sm, cln 6.65m: J, 70°, pl, sm, cln 6.651m: 6.65-6.73: Cz, 5-60°, ir, ro, cly, ven 6.71m: J, 10°, ir, ro 6.73m: J, 15°, ir, ro 6.731m: 6.73-6.86: J x	C	100	43	
	5											
		- healed ironstained joints										
	6								C	100	81	
		- highly fractured										
	7								C	100	0	
		- low strength, highly weathered, fragmented							C	100	0	
	8								C	100	0	
		- low to medium strength, highly to moderately weathered							C	100	15	
	9								C	100	0	
									C	100	0	

DRAFT

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** HW to 1.60m

TYPE OF BORING: 115mm diameter solid flight auger to 1.6m, washbore to 3.8m, then NMLC

WATER OBSERVATIONS: No free groundwater observed while augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Between Woodstock and Mt Isa

SURFACE LEVEL: --
EASTING: 342777
NORTHING: 7702238
DIP/AZIMUTH: 90°/--

BORE No: MIS-BH5-H1
PROJECT No: 200446.01
DATE: 30/11/2023
SHEET 2 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		SCHIST: fine grained, grey, high strength, slightly weathered, with healed joints and ironstained veins, fractured *(continued)*						12, 60-80°, pl, sm, fe, stn, cly, ven, at 0.01-0.02m spacing 6.9m: 6.90-6.96: J, Cz, 5-40°, ir, ro, cly, ven 6.95m: J, 40°, ir, ro	C	100	0	
	11							7m: 7.00-7.03: J x 3, 60-80°, pl, sm, cln, at 0.04m spacing 7.3m: 7.30-7.40: J x 5, 60-80°, pl, ir, ro, sm, cly, ven, at 0.01 spacing	C	100	33	
								7.35m: 7.35-7.40: Cz, 10-40°, ir, ro, cly, inf	C	100	0	
	12							7.4m: 7.40-7.48: Cz, 10-40°, ir, ro, cly, inf, fe, stn 7.48m: 7.48-7.51: J x 4, 80°, pl, ro, fe, sm, at 0.01-0.02m spacing	C	100	0	
								7.51m: 7.51-7.54: Cz, 5-60°, pl, ir, ro, sm, fe, stn 7.56m: J, 15°, pl, sm, fe, stn	C	100	19	
	13							7.58m: J, 10°, pl, sm, fe, stn 7.6m: J, 10°, ir, ro, cly, ven	C	100	0	
	14							7.61m: 7.61-7.65: Cz, 5-60°, ir, ro, fe, stn 7.65m: 7.65-7.80: J, Cz, Fct, 5-60°, ir, ro, fe, stn 7.8m: 7.80-7.90: J, 90°, ir, ro, fe, stn, cly, ven 7.88m: J, 10°, ir, ro, cly, ven, fe, stn	C	100	33	
	15 15.0	Bore discontinued at 15.0m depth - Limit of investigation						7.9m: 7.90-8.00: J, 80°, ir, ro, fe, stn, cly, ven 7.97m: 7.97-8.00: Cz, 5-60°, ir, ro, cly, ven, fe, stn				
	16							8m: 8.00-8.05: Cs, Cz, 5-40°, ir, ro, cly, inf 8.14m: J, 10°, ir, ro, cly, ven 8.17m: J, 10°, ir, ro, cly, ven 8.18m: J, 30°, pl, sm, cln 8.19m: J, 40°, pl, sm, cln				
	17							8.24m: J, 30°, pl, sm, cln 8.25m: J, 20°, pl, ro, fe, stn, cly, ven 8.28m: J, 20°, ir, ro, cly, ven				
	18							8.281m: 8.28-8.30: Fct, 10-30°, ir, ro, cly, ven 8.3m: 8.30-8.36: J, Fct, 5-60°, ir, ro, cly, ven, fe, stn 8.36m: J, 10°, ir, ro, cln 8.361m: 8.36-8.46: J x 4, 40-70°, pl, sm, cly, ven, at 0.01m spacing				
	19							8.362m: 8.36-8.46: Czm 5-60°, ir, ro, cly, ven 8.46m: 8.46-8.48: Cz, 10-40°, ir, ro, cly, ven 8.55m: J, 70°, pl, ro, cly, ven 8.6m: J, 30°, pl, ro, cly,				

DRAFT

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** HW to 1.60m

TYPE OF BORING: 115mm diameter solid flight auger to 1.6m, washbore to 3.8m, then NMLC

WATER OBSERVATIONS: No free groundwater observed while augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Between Woodstock and Mt Isa

SURFACE LEVEL: --
EASTING: 342777
NORTHING: 7702238
DIP/AZIMUTH: 90°/--

BORE No: MIS-BH5-H1
PROJECT No: 200446.01
DATE: 30/11/2023
SHEET 3 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	21							ven 8.601m: 8.60-8.69: J, 80°, pl, sm, cln 8.62m: J, 10°, pl, ro, cln 8.64m: J, 30°, pl, ro, cln 8.75m: J, 10°, pl, sm, cln 8.79m: 8.79-9.00: J x 6, 45°, pl, sm, cly, ven, fe, stn 9m: 9.00-9.05: Fct, 5-60°, ir, ro 9.05m: 9.05-9.11: J, Fct, 5-45°, pl, ir, ro 9.16m: J, 45°, pl, sm, cln 9.18m: J, 10°, ir, ro, cly, ven 9.181m: 9.18-9.25: J, Fct, 5-60°, pl, ir, ro, fe, stn 9.22m: J, 40°, pl, sm, fe, stn 9.27m: 9.27-9.43: J x 14, 40-70°, pl, ro, cly, ven, fe, stn, at 0.001-0.02m spacing 9.43m: 9.43-9.50: J, Fct, 5-60°, ir, ro, cly, inf 9.5m: 9.50-9.55: J, Fct, 5-70°, ir, pl, ro, fe, stn 9.57m: J, 60°, pl, sm, fe, stn 9.65m: 9.65-9.71: J, Fct, 5-60°, pl, ir, ro 9.651m: 9.65-9.71: J, Fct, 5-60°, pl, ir, ro 9.71m: 9.71-9.74: J x 3, 80°, pl, ro, cln 9.74m: 9.74-9.79: J, Fct, 5-70°, pl, ir, ro, at 0.001-0.01m spacing 9.79m: 9.79-9.90: J x 5, 40-60°, pl, sm, fe, stn 9.9m: 9.90-10.00: J, Fct, 5-80°, pl, ir, ro, fe, stn 10m: 10.00-10.36: J x 6, 60°, pl, sm, fe, stn, at 0.01-0.08m spacing 10.13m: 10.13-10.15: Cz, 5-60°, ir, ro, fe, stn 10.16m: 10.16-10.36: J x 4, 80°, pl, ro, cly, ven, fe, stn, at 0.01-0.02m spacing 10.36m: 10.36-10.50: Cz, 5-60°, ir, ro, cly, ven, fe, stn 10.5m: 10.50-10.53: Cs, 5-40°, ir, ro, cly, inf 10.68m: J, 15°, ir, ro, fe, stn 10.75m: J, 15°, ir, ro, fe, stn 10.82m: J, 10-20°, ir, ro, fe, stn, cly, ven 10.9m: J, 15°, ir, ro, cly, inf 10.901m: 10.90-11.00: J x 4, 80°, pl, ro, fe, stn, at 0.01m spacing 10.902m: 10.90-10.97: J, Fct, 5-60°, ir, ro, fe, stn, at 0.001-0.01m				
	22											
	23											
	24											
	25											
	26											
	27											
	28											
	29											

DRAFT

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** HW to 1.60m

TYPE OF BORING: 115mm diameter solid flight auger to 1.6m, washbore to 3.8m, then NMLC

WATER OBSERVATIONS: No free groundwater observed while augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Between Woodstock and Mt Isa

SURFACE LEVEL: --
EASTING: 342777
NORTHING: 7702238
DIP/AZIMUTH: 90°/--

BORE No: MIS-BH5-H1
PROJECT No: 200446.01
DATE: 30/11/2023
SHEET 4 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	31							spacing 11m: 11.00-11.07: J, Fct, 5-60°, ir, ro, fe, stn 11.18m: J, 30°, ir, ro, cly, ven 11.181m: 11.18-11.25: Fct, Cz, 5-40°, ir, ro, fe, stn, cly, ven 11.23m: J, 40°, ir, ro, cly, ven, fe, stn 11.231m: 11.23-11.33: J x 8, 70-90°, pl, ro, cly, ven, fe, stn, at 0.01m spacing 11.3m: J, 10°, ir, ro, fe, stn 11.301m: 11.30-11.49: J, Fct, 5-80°, ir, pl, ro, sm, fe, stn, cly, ven 11.49m: J, 30°, pl, sm, cln 11.491m: 11.49-11.53: J x 3, 70°, pl, sm, cln 11.54m: J, 10°, ir, ro, cln 11.541m: 11.54-11.58: J x 3, 30°, pl, sm, cly, ven 11.57m: 11.57-11.63: J x 2, 80°, pl, sm, cln 11.63m: J, 10°, ir, ro, cly, ven 11.631m: 11.63-11.80: J x 21, 60-80°, pl, sm, fe, stn, cly, ven, at 0.001-0.01m spacing 11.67m: 11.67-11.73: Cz, 5-60°, ir, ro 11.8m: 11.80-11.90: J, Fct, 5-60°, pl, ir, ro, sm 11.93m: J, 20°, pl, sm, fe, stn 12m: J, 10°, ir, sm, fe, stn 12.001m: 12.00-12.03: Cz, 5-60°, ir, pl, ro, sm 12.03m: 12.03-12.06: J x 4, 90°, pl, ro, fe, stn,a t 0.01m spacing 12.06m: J, 10°, ir, ro 12.061m: 12.06-12.35: J x 20, 60-80°, pl, sm, cly, ven, fe, stn, at 0.001-0.04m spacing 12.12m: J, 10°, ir, ro 12.24m: J, 10°, ir, ro 12.27m: J, 10°, ir, ro 12.28m: J, 15°, ir, ro 12.35m: 12.35-12.46: Cz, 5-60°, ir, ro, fe, stn 12.48m: J, 10°, ir, ro, cln 12.52m: J, 40°, pl, sm, cln 12.66m: J, 60°, pl, sm, cln 12.67m: 12.67-12.74: J, 80°, pl, fe, stn 12.68m: J, 10°, pl, sm, cln 12.681m: 12.68-12.72: J, 80°, pl, sm, cln 12.72m: J, 15°, ir, ro, fe, stn 12.74m: 12.74-12.81: J x 5, 20°, pl, sm, fe, stn 12.81m: 12.81-13.00: J x				
	32											
	33											
	34											
	35											
	36											
	37											
	38											
	39											

DRAFT

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** HW to 1.60m

TYPE OF BORING: 115mm diameter solid flight auger to 1.6m, washbore to 3.8m, then NMLC

WATER OBSERVATIONS: No free groundwater observed while augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Between Woodstock and Mt Isa

SURFACE LEVEL: --
EASTING: 342777
NORTHING: 7702238
DIP/AZIMUTH: 90°/--

BORE No: MIS-BH5-H1
PROJECT No: 200446.01
DATE: 30/11/2023
SHEET 5 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW, HW, MW, SW, FS, FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	41							5, 60°, pl, sm, fe, stn 12.811m: J, 10°, pl, sm, fe, stn 12.84m: 12.84-12.90: J x 3, 30°, pl, st, sm, cln, at 0.02m spacing 13m: 13.00-13.06: J, Fct, 5-80°, pl, ir, ro, sm, at 0.001-0.01m spacing 13.06m: 13.06-13.25: J x 16, 40-60°, pl, sm, fe, stn, cly, ven, at 0.001-0.03m spacing 13.25m: 13.25-13.35; J x 7, 40-60°, pl, ro, cly, ven, at 0.01m spacing 13.3m: J, 10°, ir, ro, cly, inf 13.41m: J, 15°, ir, ro, cly, ven, fe, stn 13.411m: 13.41-13.52: J x 2, 80°, pl, sm, cly, ven, at 0.03m spacing 13.58m: 13.58-13.90: J x 14, 60-70°, pl, sm, fe, stn, at 0.01-0.07m spacing 13.63m: 13.63-13.67: J, 80°, ir, ro, fe, stn 13.69m: J, 15°, ir, ro, fe, stn 13.75m: J, 15°, ir, ro, fe, stn, cly, ven 13.751m: 13.75-13.83: J, 90°, pl, ro, fe, stn 13.9m: 13.90-14.00: J, x 10, 70-90°, pl, ro, fe, stn, at 0.01m spacing 14m: 14.00-14.10: J, Fct, 5-60°, pl, ir, ro, cly, ven, fe, stn 14.1m: 14.10-14.20: J x 14, 70-90°, pl, ir, ro, fe, stn, at 0.001-0.01m spacing 14.13m: J, 15°, ir, ro, fe, stn 14.15m: J, 40°, ir, ro, fe, stn, cly, ven 14.19m: J, 15°, ir, ro, fe, stn 14.2m: 14.20-14.82: J x 8, 40-60°, pl, ro, fe, stn 14.25m: J, 60°, pl, ro, fe, stn 14.45m: J, 40°, pl, sm, fe, stn 14.46m: J, 10°, pl, sm, fe, stn 14.48m: J, 10°, ir, ro, fe, stn 14.52m: 14.52-15.00: J x 8, 60-80°, pl, ir, ro, sm, fe, stn, at 0.03-0.12m spacing				
	42											
	43											
	44											
	45											
	46											
	47											
	48											
	49											

DRAFT

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** HW to 1.60m

TYPE OF BORING: 115mm diameter solid flight auger to 1.6m, washbore to 3.8m, then NMLC

WATER OBSERVATIONS: No free groundwater observed while augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Between Woodstock and Mt Isa

SURFACE LEVEL: --
EASTING: 342859
NORTHING: 7702228
DIP/AZIMUTH: 90°/--

BORE No: MIS-BH8-H1
PROJECT No: 200446.01
DATE: 29/11/2023
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	0.1	FILL Gravelly Sandy CLAY (CI): medium plasticity, brown, fine to coarse sand, fine to coarse gravel, trace organics, w<PL, very stiff							D E			
		Silty CLAY (CH): high plasticity, pale brown, w<PL, hard (residual)							D			
	0.9	Silty CLAY (CH): high plasticity, red-brown, w<PL, hard (residual)							D			
	1								S			
	2											
	2.5	Gravelly CLAY (CI): medium plasticity, grey mottled red-brown, with ironstained veins, trace fine to medium sand, w<PL, very stiff (residual)							S			
	3											
	4											
	4.0	Sandy GRAVEL (GP): fine to medium, grey mottled pale grey and red-brown, with low plasticity clay, dry, very dense (residual)							S			
	5											
	5.4	SCHIST: fine grained, grey, medium strength, moderately weathered, fractured, foliated, ironstained veins, healed joints - clay seam (~30mm) - healed joints, ironstained veins (~120mm) - slightly weathered						5.58m: J, 15°, ir, ro, cly, inf 5.6m: 5.60-5.63: Cs, 5-15°, ir, ro, cly, inf 5.74m: J, 30°, ir, ro, cly, inf	C	100	75	PL(A) = 0.38 PL(D) = 0.41
	6							5.8m: J, 10°, pl, ro, cly, ven, fe, stn 5.93m: J, 20°, pl, sm, cly, ven	C	100	43	
	7							6.08m: J, 40°, pl, st, sm, cln 6.26m: 6.26-6.49: J x 7, 45°, pl, sm, cln, at 0.01-0.06m spacing	C UCS	100	48	
	8	- fractured						6.29m: J, 60°, pl, sm, cln 6.36m: J, 10°, ir, ro, cln 6.42m: 6.42-6.43: Cz, 5-40°, ir, ro, cly, ven	C	100	18	PL(A) = 0.34 PL(D) = 0.3
								6.49m: 6.49-6.53: Cz, 5-60°, ir, ro, cly, ven 6.53m: J, 30°, pl, sm, cln	C	100	0	
	9							6.64m: J, 15°, ir, sm, cln 6.7m: 6.70-6.73: J x 2, 30°, pl, sm, cln 6.88m: J, 40°, pl, sm, cly, inf	C	100	23	PL(A) = 0.44 PL(D) = 0.37
								6.9m: 6.90-6.95: Cs, 5-40°, ir, cly, inf 7.03m: J, 40°, pl, sm,	C	100	15	

DRAFT

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** sp **CASING:** HW to 2.6m

TYPE OF BORING: 115mm diameter solid flight auger to 2.5m, washbore to 5.4m, then NMLC

WATER OBSERVATIONS: No free groundwater observed while augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Between Woodstock and Mt Isa

SURFACE LEVEL: --
EASTING: 342859
NORTHING: 7702228
DIP/AZIMUTH: 90°/--

BORE No: MIS-BH8-H1
PROJECT No: 200446.01
DATE: 29/11/2023
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	11	SCHIST: fine grained, grey, medium strength, moderately weathered, fractured, foliated, ironstained veins, healed joints *(continued)*						cln 7.08m: J, 60°, pl, sm, cln 7.16m: 7.16-7.21: J x 4, 40°, pl, sm, cln, at 0.005-0.01m spacing 7.35m: J, 60°, pl, sm, cln 7.43m: J, 60°, pl, sm, cln 7.44m: J, 10°, ir, sm, cln 7.45m: J, 60°, pl, sm, cln 7.67m: J, 60°, pl, sm, cln 7.68m: J, 20°, ir, sm, cln 7.75m: 7.75-7.80: J, Fct, 5-60°, ir, ro, cly, inf 7.751m: 7.75-7.80: J x 2, 60°, pl, ro, cly, ven 7.9m: J, 60°, pl, sm, cln 7.96m: J, 60°, pl, sm, cln 8.05m: 8.05-8.30: J x 12, 60°, pl, sm, cln, at 0.01-0.03m spacing 8.1m: J, 70°, ir, ro, cln 8.13m: J, 70°, ir, ro, cln 8.3m: 8.30-8.37: J, Cz, 5-60°, pl, ir, ro, sm, cly, ven 8.44m: J, 60°, pl, sm, cln 8.49m: J, 60°, pl, sm, cln 8.54m: J, 10°, ir, ro, cln 8.6m: 8.60-8.90: J x 11, 60°, pl, sm, cln, at 0.002-0.04m spacing 9.08m: J, 60°, pl, sm, fe, stn 9.09m: 9.09-9.14: Cz, 5-40°, ir, ro, fe, stn 9.14m: J, 10°, ir, ro, fe, stn 9.15m: J, 40°, pl, sm, fe, stn 9.151m: 9.15-9.15: Cz, 5-40°, ir, ro, fe, stn 9.19m: J, 40°, pl, sm, fe, stn 9.21m: 9.21-9.29: J, Cz, 5-70°, ir, ro, fe, stn 9.23m: J, 10°, ir, ro, cly, inf 9.28m: J, 60°, pl, sm, cln 9.35m: J, 60°, pl, sm, cln 9.41m: 9.41-9.63: J x 11, 60°, pl, sm, fe, stn, at 0.001-0.03m spacing 9.52m: J, 15°, ir, ro, fe, stn 9.62m: 9.62-9.70: J x 3, 60°, pl, sm, fe, stn, at 0.001-0.01m spacing 9.73m: J, 40°, pl, sm, cln 9.85m: J, 60°, pl, sm, cln 9.92m: J, 70°, pl, sm, cln 9.93m: J, 30°, pl, ir, ro,	C	100	15	PL(A) = 0.38 PL(D) = 0.14
									C	100	57	
	11.2	Bore discontinued at 11.2m depth - Limit of investigation										
	12											
	13											
	14											
	15											
	16											
	17											
	18											
	19											

DRAFT

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** sp **CASING:** HW to 2.6m

TYPE OF BORING: 115mm diameter solid flight auger to 2.5m, washbore to 5.4m, then NMLC

WATER OBSERVATIONS: No free groundwater observed while augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Between Woodstock and Mt Isa

SURFACE LEVEL: --
EASTING: 342859
NORTHING: 7702228
DIP/AZIMUTH: 90°/--

BORE No: MIS-BH8-H1
PROJECT No: 200446.01
DATE: 29/11/2023
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW, HW, MW, SW, FS, FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	21							cly, ven 10m: 10.00-10.39: J x 11, 60°, pl, ro, or, sm, fe, stn, at 0.001-0.07m spacing 10.07m: 10.07-10.32: J x 3, 15-30°, ir, ro, fe, stn 10.36m: 10.36-10.50: J x 3, 60-70°, ir, ro, cly, ven, at 0.01-0.02m spacing 10.56m: J, 45°, pl, sm, cln 10.72m: J, 40°, pl, ro, cly, ven 10.74m: 10.74-10.78: Cz, 5-60°, ir, ro, cly, ven 10.75m: J, 60°, pl, sm, cln 10.82m: J, 60°, pl, sm, cln 10.94m: J, 80°, pl, sm, cln 11.06m: J, 40°, pl, ro, fe, stn 11.08m: J, 15°, ir, ro, cly, ven 11.13m: J, 60°, pl, sm, fe stn				
	22											
	23											
	24											
	25											
	26											
	27											
	28											
	29											

DRAFT

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** sp **CASING:** HW to 2.6m

TYPE OF BORING: 115mm diameter solid flight auger to 2.5m, washbore to 5.4m, then NMLC

WATER OBSERVATIONS: No free groundwater observed while augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project - Mt Isa Substation
LOCATION: Via Diamantina Dvelopment Road, Mt Isa

SURFACE LEVEL: --
EASTING: 342836
NORTHING: 7701965
DIP/AZIMUTH: 90°/--

BORE No: MIS-TP15-H1
PROJECT No: 200446.01
DATE: 28/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	FILL Gravelly Sandy CLAY (CI): medium plasticity, brown, fine to coarse sand, fine to coarse gravel, trace organics, w<PL, hard		D E	0.0				
	0.2	FILL FLY ASH: dark grey			0.2				
	0.3	FILL Gravelly CLAY (CI): medium plasticity, brown, fine to coarse gravel, with fine to coarse sand, w<PL, hard		D B	0.3				
					0.5				
				S	0.6		18,23,21 N = 44		
	0.9	Silty CLAY (CH): high plasticity, red-brown, with fine to medium sand, w<PL, very stiff (residual)			0.95				
1				D	1.0				1
					1.5				
		- trace fine to medium gravel		S			7,12,14 N = 26		
					1.9				
2				D	1.95				2
					2.1				
					2.7				
				D					
3					3.0				3
	3.11			S	3.11		20/110mm HB		
		Bore discontinued at 3.11m depth - Limit of investigation							
4									4

DRAFT

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 300mm diameter short flight auger to 2.6m depth, then 115mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed while augering

REMARKS: Coordinates are in MGDA94 Zone 54K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project - Mt Isa Substation
LOCATION: Via Diamantina Dvelopment Road, Mt Isa

SURFACE LEVEL: --
EASTING: 342755
NORTHING: 7702176
DIP/AZIMUTH: 90°/--

BORE No: MIS-TP6-H1
PROJECT No: 200446.01
DATE: 30/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	FILL Sandy GRAVEL (GP): fine to coarse, brown, fine to coarse sand, with low plasticity clay, dry, medium dense to dense		D E	0.0 0.2				
	0.3	FILL Gravelly Sandy CLAY (CL): low plasticity, brown, fine to coarse sand, fine to coarse gravel, w<PL, hard		D	0.3 0.5				
	0.6	Gravelly Sandy CLAY (CL-CI): low to medium plasticity, red-brown, fine to coarse sand, fine to medium gravel, w<PL, hard, with relict rock structure (residual)		S D B	0.6 0.9 0.95 1.0		22,25,21 N = 46		
	1								1
				D	1.3				
	1.54	Bore discontinued at 1.54m depth - Auger refusal on probable low strength or stronger rock		S S	1.5 1.52 1.54		10/20mm HB 10/20mm HB		
	2								2
	3								3
	4								4

DRAFT

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 300mm diameter short flight auger

WATER OBSERVATIONS: No free groundwater observed while augering

REMARKS: Coordinates are in MGDA94 Zone 54K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project - Mt Isa Substation
LOCATION: Via Diamantina Dvelopment Road, Mt Isa

SURFACE LEVEL: --
EASTING: 342856
NORTHING: 7702084
DIP/AZIMUTH: 90°/--

BORE No: MIS-TP9-H2
PROJECT No: 200446.01
DATE: 29/11/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
	0.0	FILL Gravelly Sandy CLAY (CL): low plasticity, brown, fine to coarse sand, fine to coarse gravel, trace organics, w<PL, hard		D, B	0.0				
					0.2				
	0.3	FILL Gravelly Sandy CLAY (CL): low plasticity, pale brown, fine to coarse sand, fine to medium gravel, w<PL, hard		D	0.3				
				S	0.5		22, 30/80mm		
					0.73				
	0.8	Gravelly Sandy CLAY (CL-CI): low to medium plasticity, red-brown, fine to coarse sand, fine to medium gravel, w<PL, hard (residual)		D	0.8				
1					1.0				1
	1.3	Sandy CLAY (CH): high plasticity, red-brown, fine to coarse sand, trace fine gravel, w<PL, very stiff (residual)							
					1.5				
				S			14,14,18 N = 32		
					1.9				
2				D	1.95				2
					2.1				
	2.5	Gravelly Sandy CLAY (CI): medium plasticity, orange-brown, fine to coarse sand, fine to medium gravel, w<PL, very stiff (residual)							
					2.8				
				D					
3	3.0	Gravelly Sandy CLAY (CL): low plasticity, grey, fine to medium sand, fine gravel, w<PL, very stiff (residual)			3.0				3
				S			9,12,17 N = 29		
	3.45	Bore discontinued at 3.45m depth - Limit of investigation			3.45				
4									4

DRAFT

RIG: Gemco Drill 210B **DRILLER:** Q Drill **LOGGED:** SP **CASING:** Uncased

TYPE OF BORING: 300mm diameter short flight auger

WATER OBSERVATIONS: No free groundwater observed while augering

REMARKS: Coordinates are in MGDA94 Zone 54K

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL Pty Limited
PROJECT: Copperstring - Proposed Substations and Transmissio
LOCATION: Flinders Substation via Kennedy Developmental Road, Hughenden
SURFACE LEVEL:
COORDINATE: E:204686.0, N:7688348.0
DATUM/GRID: MGA94 Zone 55K
DIP/AZIMUTH: 90°/---°
LOCATION ID: FLR330_BH9_H2
PROJECT No: 200446.01
DATE: 24/09/23
SHEET: 1 of 2

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0	CLAY (CH), trace sand, trace gravel: brown; high plasticity; fine sand; , fine gravel.		RS	St	w<PL		B		0.20		
		0.40m: no gravel or sand			VSt			D		0.60		
	1	1.00m: trace fine to medium sand			VSt			SPT		0.80 1.00	SPT	7,11,10 N=21
	1.50	CLAY (CH), trace sand, trace gravel: yellow-brown mottled pale grey and pale brown; high plasticity; fine to coarse sand; , fine gravel.						D		1.50 1.70		
	2				VSt							
		2.50m: with veins of calcium carbonate and ironstaining		RS		w<PL		SPT		2.50 2.95	SPT	8,15,18 N=33
	3				H							
	3.60	CLAY (CH), trace sand, trace gravel: grey mottled yellow-brown; high plasticity; fine to coarse sand; , fine gravel; with veins of calcium carbonate and ironstaining, with relict rock structure.						SPT		4.00 4.28	SPT	13,30/130
	4											
	5				H			SPT		5.50 5.79	SPT	9,30/140
	6											
	7			RS		w<PL		SPT		7.00 7.45	SPT	7,8,15 N=23
	8				VSt							
	9				H			SPT		8.50 8.79	SPT	17,30/140

DCP9/100 (5, 10, 15)

NOTES: [#]Soil origin is "probable" unless otherwise stated. [*]Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Gemco
OPERATOR: Q Drill
LOGGED: SP
METHOD: 110mm diameter solid flight auger to 5.5m, then mud rotary
CASING: NW to 5.6m
REMARKS: No free groundwater observed during augering

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: UGL Pty Limited
PROJECT: Copperstring - Proposed Substations and Transmissio
LOCATION: Flinders Substation via Kennedy Developmental Road, Hughenden
SURFACE LEVEL:
COORDINATE: E:204686.0, N:7688348.0
DATUM/GRID: MGA94 Zone 55K
DIP/AZIMUTH: 90°/---°
LOCATION ID: FLR330_BH9_H2
PROJECT No: 200446.01
DATE: 24/09/23
SHEET: 2 of 2

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	11	[CONT] CLAY (CH), trace sand, trace gravel: grey mottled yellow-brown; high plasticity; fine to coarse sand; , fine gravel; with veins of calcium carbonate and ironstaining, with relict rock structure.		RS	H	w<PL		SPT		10.00 10.17	SPT	21,8/20 (HB)
	12							SPT		11.50 11.69	SPT	20,10/40 (HB)
	13							SPT		13.00 13.19	SPT	26,13/40 (HB)
	14							SPT		14.50 14.64	SPT	30/140
	15	Borehole discontinued at 14.64m depth. Limit of investigation.										
	16											
	17											
	18											
	19											

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Gemco
OPERATOR: Q Drill
LOGGED: SP
METHOD: 110mm diameter solid flight auger to 5.5m, then mud rotary
CASING: NW to 5.6m
REMARKS: No free groundwater observed during augering

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: UGL Pty Limited
PROJECT: Copperstring - Proposed Substations and Transmissio
LOCATION: Flinders Substation via Kennedy Developmental Road, Hughenden
SURFACE LEVEL:
COORDINATE: E:204683.0, N:7688545.0
DATUM/GRID: MGA94 Zone 55K
DIP/AZIMUTH: 90°/---°
LOCATION ID: FLR330_BH7_H2
PROJECT No: 200446.01
DATE: 22/09/23
SHEET: 1 of 2

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
		Sandy CLAY (CI), with rootlets, with gravel: brown; medium plasticity; fine to coarse sand; coarse, angular to rounded gravel.		RS	St	w<PL		B		0.20		DCP9/100 (5, 10, 15; 20/60)
		0.35m: no organics						ES		0.40		
	0.90									0.60		
		CLAY (CH), with sand: brown; high plasticity; fine sand.		RS	VSt			ES		0.80		
										1.00		
								SPT		1.40	SPT	6,8,9 N=17
								ES		1.60		
	2.00									2		
		CLAY, with gravel, trace sand: grey, brown and yellow-brown; high plasticity; fine to medium gravel; fine to coarse sand; with calcite layers.						SPT		2.50	SPT	7,12,19 N=31
										2.95		
		4.00m: with relict rock structure								4.00		
								SPT		4.45	SPT	10,16,20 N=36
						w<PL				5		
								SPT		5.50	SPT	14,30/140
				RS	H					5.79		
										6		
								SPT		7.00	SPT	14,30/145
										7.30		
										8		
								SPT		8.50	SPT	14,25,30/120
										8.92		
										9		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: GT5
METHOD: 110mm diameter solid flight auger
REMARKS: No free groundwater observed during augering
OPERATOR: Ground Test
LOGGED: MM
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

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BOREHOLE LOG

CLIENT: UGL Pty Limited
PROJECT: Copperstring - Proposed Substations and Transmissio
LOCATION: Flinders Substation via Kennedy Developmental Road, Hughenden

SURFACE LEVEL:
COORDINATE: E:204683.0, N:7688545.0
DATUM/GRID: MGA94 Zone 55K
DIP/AZIMUTH: 90°/---°

LOCATION ID: FLR330_BH7_H2
PROJECT No: 200446.01
DATE: 22/09/23
SHEET: 2 of 2

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	9.99	Sandy CLAY (CH): grey, brown and yellow; high plasticity; fine sand; with calcite layers and relict rock structure (cont.).		RS	H	w<PL		SPT	10.00 - 10.40	10.00	SPT	15,26,30/100
	11							SPT	11.50 - 11.79	11.50	SPT	14,30/140
	12									12		
	13	13.50m: grey-brown, extremely weathered mudstone						SPT	13.00 - 13.20	13.00	SPT	21,15/50 (HB)
	14							SPT	14.50 - 14.67	14.50	SPT	18,30/120
	15	Borehole discontinued at 14.67m depth. Limit of investigation.								15		
	16									16		
	17									17		
	18									18		
	19									19		

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: GT5
METHOD: 110mm diameter solid flight auger
REMARKS: No free groundwater observed during augering

OPERATOR: Ground Test

LOGGED: MM
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

BOREHOLE LOG

CLIENT: UGL Pty Limited
PROJECT: Copperstring - Proposed Substations and Transmissio
LOCATION: Flinders Substation via Kennedy Developmental Road, Hughenden
SURFACE LEVEL:
COORDINATE: E:204822.0, N:7688402.0
DATUM/GRID: MGA94 Zone 55K
DIP/AZIMUTH: 90°/---°
LOCATION ID: FLR330_BH16_H2
PROJECT No: 200446.01
DATE: 24/09/23
SHEET: 1 of 2

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0	CLAY (CH), trace sand, trace gravel: brown; high plasticity; fine to coarse sand; , fine to coarse, rounded to sub-rounded gravel.		RS	St / VSt, H	w<PL		B		0.20		
								ES/D		0.40		
										0.60		
		0.70m: pale brown								0.80		
								ES		1.00		
	1.00	CLAY (CH), trace sand, trace gravel: pale brown; high plasticity; fine to coarse sand; , fine gravel.			VSt			SPT		1.40	SPT	8,11,12 N=23
								ES		1.60		
	2									2		
		2.50m: with relict rock structure						SPT		2.50	SPT	9,15/90 (HB)
										2.74		
	3									3		
	4							SPT		4.00	SPT	10,10/90 (HB)
										4.24		
	5			RS		w<PL		SPT		5.50	SPT	11,10/40 (HB)
										5.69		
	6				H					6		
	7							SPT		7.00	SPT	12,10/50 (HB)
										7.20		
	8									8		
								SPT		8.50	SPT	10/100 (HB)
	9									9		

DCP9/100 — 5, 10, 15 — 15/95

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: GT50
METHOD: 110mm diameter solid flight auger
REMARKS: No free groundwater observed during augering
OPERATOR: Ground Test
LOGGED: DH
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

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BOREHOLE LOG

CLIENT: UGL Pty Limited
PROJECT: Copperstring - Proposed Substations and Transmissio
LOCATION: Flinders Substation via Kennedy Developmental Road, Hughenden
SURFACE LEVEL:
COORDINATE: E:204822.0, N:7688402.0
DATUM/GRID: MGA94 Zone 55K
DIP/AZIMUTH: 90°/---°
LOCATION ID: FLR330_BH16_H2
PROJECT No: 200446.01
DATE: 24/09/23
SHEET: 2 of 2

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	9.99	Silty CLAY (CH): pale brown; high plasticity; with relict rock structure (cont.).		RS	H	w<PL		SPT		10.00	SPT	13,22 (HB)
										10.30		
	11									11		
								SPT		11.50	SPT	13,10/30 (HB)
										11.68		
	12									12		
	13							SPT		13.00	SPT	10/90 (HB)
	14							SPT		14.50		10/20
		Borehole discontinued at 14.52m depth. Limit of investigation.										
	15									15		
	16									16		
	17									17		
	18									18		
	19									19		

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: GT50
METHOD: 110mm diameter solid flight auger
REMARKS: No free groundwater observed during augering
OPERATOR: Ground Test
LOGGED: DH
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

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Douglas PARTNERS

BOREHOLE LOG

CLIENT: UGL Pty Limited
PROJECT: Copperstring - Proposed Substations and Transmission Line
LOCATION: Woodstock to Mt Isa, Woodstock, QLD
Kennedy Developmental Road, Hughenden

SURFACE LEVEL:
COORDINATE: E:205079.0, N:7688365.0
DATUM/GRID: MGA94 55K
DIP/AZIMUTH: 90°/---°

LOCATION ID: FLR500_TP2_H
PROJECT No: 200446.01
DATE: 19/09/23
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0	Silty CLAY (CH): brown; high plasticity.			VSt			B		0.20		
					VSt			ES/D		0.40		
		0.70m: pale brown			H			ES		0.60		
	1	1.00m: mottled orange-brown						SPT		0.80		
										1.00	SPT	9,9,11 N=20
		1.50m: with calcite		RS		w<PL		ES		1.40		
										1.45		
	2				VSt					1.60		
								SPT		2.00	SPT	6,8,10 N=18
										2.45		
								U		2.50		
	3				H					2.80		
								SPT		3.00	SPT	8,18,13 (HB)
	3.45	Borehole discontinued at 3.45m depth. Limit of investigation.								3.45		
	4									4		

DCP9/100: 5, 10, 15

DRAFT

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: GT50
METHOD: 300mm diameter SFA to 1.5m, then 110mm diameter SFA
REMARKS: No free groundwater observed. SFA = solid flight auger

OPERATOR: Ground Test
CASING: Nil

LOGGED: DH

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BOREHOLE LOG

CLIENT: UGL Pty Limited
PROJECT: Copperstring - Proposed Substations and Transmission Line
LOCATION: Woodstock to Mt Isa, Woodstock, QLD
Kennedy Developmental Road, Hughenden

SURFACE LEVEL:
COORDINATE: E:208182.0, N:7688301.0
DATUM/GRID: MGA94 55K
DIP/AZIMUTH: 90°/---°

LOCATION ID: FLR500_TP6_H
PROJECT No: 200446.01
DATE: 20/09/23
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.00	Silty CLAY (CH), with sand: brown; high plasticity; fine to coarse sand.		ALV	St / VSt / H	w<PL		ES		0.20	DCP9/100	5 / 10 / 15 / 15/85
								ES		0.40		
										0.60		
	0.70	Silty CLAY (CH): pale brown mottled red-brown; high plasticity.						ES		0.80		
	1	1.00m: calcite veins								1.00		
								SPT			SPT	11,11,11 N=22
										1.40		
										1.45		
								ES		1.60		
	2			RS	VSt	w<PL				2.00		
								SPT			SPT	9,12,16 N=28
										2.45		
	3				H			SPT		3.00	SPT	10,18,5/50 (HB)
	3.35	Borehole discontinued at 3.35m depth. Limit of investigation.								3.35		
	4									4		

DRAFT

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: GT50
METHOD: 300mm diameter SFA to 1.5m, then 110mm diameter SFA
REMARKS: No free groundwater observed. SFA = solid flight auger

OPERATOR: Ground Test
CASING: Nil

LOGGED: DH

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BOREHOLE LOG

CLIENT: UGL Pty Limited
PROJECT: Copperstring - Proposed Substations and Transmission Line
LOCATION: Woodstock to Mt Isa, Woodstock, QLD
Kennedy Developmental Road, Hughenden

SURFACE LEVEL:
COORDINATE: E:205043.0, N:7688233.0
DATUM/GRID: MGA94 55K
DIP/AZIMUTH: 90°/---°

LOCATION ID: FLR500_TP5_H
PROJECT No: 200446.01
DATE: 20/09/23
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.00	Silty CLAY (CH), with sand: brown; high plasticity; fine to coarse sand.			St			B		0.20		
					VSt					0.40		
		0.60m: pale brown						D		0.60		
								B		0.80		
	1			ALV	H	w<PL		SPT		1.00	SPT	10,6/20 (HB)
										1.17		
								D		1.40		
										1.60		
	2.00	Silty CLAY (CH): pale brow mottled red-brown; high plasticity.						SPT		2.00	SPT	9,12,6/40 (HB)
				RS	H	w<PL				2.34		
	3									3.00		
								SPT			SPT	9,6/50 (HB)
	3.20	Borehole discontinued at 3.20m depth. Limit of investigation.								3.20		
	4									4		

DCP9/100: 5, 10, 15

DRAFT

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: GT50
METHOD: 300mm diameter SFA to 1.5m, then 110mm diameter SFA
REMARKS: No free groundwater observed. SFA = solid flight auger

OPERATOR: Ground Test
CASING: Nil

LOGGED: DH

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BOREHOLE LOG

CLIENT: UGL Pty Limited
PROJECT: Copperstring - Proposed Substations and Transmission Line
LOCATION: Woodstock to Mt Isa, Woodstock, QLD
Kennedy Developmental Road, Hughenden

SURFACE LEVEL:
COORDINATE: E:205228.0, N:7688187.0
DATUM/GRID: MGA94 55K
DIP/AZIMUTH: 90°/---°

LOCATION ID: FLR500_BH13_I
PROJECT No: 200446.01
DATE: 19/09/23
SHEET: 1 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(†) DENSITY.(†)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	ROCK FRACTURE SPACING (m)	ROCK DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
		0.00	Silty CLAY (CH), trace organics: brown; high plasticity.		ALV	H	w<PL									D/B	0.00-0.20	0.20		
						VSt														
						H														
			0.60m: trace fine sand			H										D	0.60-0.80	0.60		
		1				VSt												0.80		
																		1.00		
		1.30	Silty CLAY (CH), trace sand: pale brown mottled yellow-brown; high plasticity; fine sand.													SPT	1.00-1.45	1.30	SPT	8,12,17 N=29
																D	1.45-1.50	1.50		
		2				VSt												2		
			2.50m: extremely weathered mudstone with soil properties, veins of calcium carbonate		RS		w<PL									SPT	2.50-2.70	2.50	SPT	15,15/50 (HB)
		3				H												2.70		
																		3		
		4																4.00		
		4.40	Silty CLAY (CH): yellow-brown mottled grey and pale brown; high plasticity; (extremely weathered mudstone with soil properties).					NA		NA						SPT	4.00-4.45	4.45	SPT	11,17,22 N=39
		5				H												5		
			5.50m: ironstained veins													SPT	5.50-5.95	5.50	SPT	5,12,14 N=26
		6																5.95		
																		6		
		7	7.00m: calcium carbonate veins		RS	VSt	w<PL									SPT	7.00-7.45	7.00	SPT	9,12,14 N=26
																		7.45		
		8																8		
																SPT	8.50-8.95	8.50	SPT	10,18,22 N=40
		9				H												8.95		

DCP9/100 5 10 15 15/90

DRAFT

NOTES: (#)Soil origin is "probable" unless otherwise stated. (†)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Gemco
OPERATOR: Q Drill
LOGGED: SP
METHOD: 115mm diameter solid flight auger to 5.5m, mud rotary to 13.14m
CASING: NW to 5.6m
REMARKS: No free groundwater observed during augering

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL Pty Limited
PROJECT: Copperstring - Proposed Substations and Transmission Line
LOCATION: Woodstock to Mt Isa, Woodstock, QLD
Kennedy Developmental Road, Hughenden

SURFACE LEVEL:
COORDINATE: E:205228.0, N:7688187.0
DATUM/GRID: MGA94 55K
DIP/AZIMUTH: 90°/---°

LOCATION ID: FLR500_BH13_I
PROJECT No: 200446.01
DATE: 19/09/23
SHEET: 2 of 3

GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) / DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	ROCK FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	10.00	[CONT] Silty CLAY (CH): yellow-brown mottled grey and pale brown; high plasticity; (extremely weathered mudstone with soil properties).		RS											SPT		10.25	SPT	24,30/100
	11	Silty CLAY (CH): grey mottled yellow-brown; high plasticity; veins of ironstaining and calcium carbonate (extremely weathered mudstone with soil properties).															11		
	11.50				H	w<PL	NA		NA						SPT		11.50		10/30 (HB) No SPT recovery
	12																12		
	13	MUDSTONE: grey mottled yellow-brown															13.00	SPT	10/30 (HB)
	13.14	MUDSTONE: grey mottled yellow-brown, fine grained, laminated; ironstaining and calcium carbonate veins					SW	13.14 13.25	H				13.22m: JT/10°, IR, VNR CA, RF 13.24m: JT/10°, IR, VNR CA, RF, VNR Clay 13.29m: JT/15°, IR, INF Clay, RF 13.35m: JT/20°, IR, INF Clay, RF 13.38m: JT/15°, IR, SN Fe, RF 13.44m: JT/10°, IR, VNR Clay, RF 13.47m: JT/10°, IR, INF Clay, RF 13.55m: JT/20°, UN, VNR Clay, RF 13.60m: JT/10°, PR, SM			13.14	PLT	PL(D)=8.05MPa
	14				NA	NA	HW		VL to L	100	0				C		14	PLT PLT PLT PLT PLT	PL(A)=7.11MPa PL(A)=0.19MPa PL(A)=0.1MPa PL(A)=0.47MPa PL(D)=0.14MPa
	15.00	Borehole discontinued at 15.00m depth. Limit of investigation.											13.64m: JT/10°, IR, SN Fe, RF, VNR Clay 13.66m: JT/10°, IR, VNR CA, RF 13.67m: JT/10°, IR, SN Fe, RF 13.70m: JT/15°, IR, SN Fe, RF 13.72m: JT/10°, IR, VNR Clay, RF, SN Fe 13.74m: JT/20°, IR, VNR Clay, RF, SN Fe 13.76m: JT/10°, IR, VNR CA, RF 13.80m: JT/10°, IR, VNR CA, RF 13.82m: JT/15°, IR, SN Fe, RF 13.85m: JT/20°, IR, VNR CA, RF 13.89m: JT/10°, PR, SN Fe, SM 13.94m: JT/10°, PR, SN Fe, SM 13.96m: JT/20°, IR, VNR CA, RF 13.98m: JT/40°, PR, INF Clay, RF 14.04m: FC/ 10°, IR, VNR Clay, RF 14.10m: JT/10°, PR, VNR Clay, RF, SN Fe 14.14m: JT/10°, PR, VNR Clay, RF, SN Fe 14.18m: JT/10°, IR, RF 14.20m: JT/10°, IR, VNR CA, RF, VNR Clay 14.22m: JT/10°, IR, VNR Fe, RF 14.25m: JT/10°, PR, SN Fe, SM 14.30m: JT/10°,				15.00	PLT PLT	PL(A)=0.17MPa
	16																16		
	17																17		
	18																18		
	19																19		

DRAFT

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Gemco
OPERATOR: Q Drill
LOGGED: SP
METHOD: 115mm diameter solid flight auger to 5.5m, mud rotary to 13.14
CASING: NW to 5.6m
REMARKS: No free groundwater observed during augering

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL Pty Limited
PROJECT: Copperstring - Proposed Substations and Transmission Line
LOCATION: Woodstock to Mt Isa, Woodstock, QLD
Kennedy Developmental Road, Hughenden

SURFACE LEVEL:
COORDINATE: E:205228.0, N:7688187.0
DATUM/GRID: MGA94 55K
DIP/AZIMUTH: 90°/---°

LOCATION ID: FLR500_BH13_I
PROJECT No: 200446.01
DATE: 19/09/23
SHEET: 3 of 3

CONDITIONS ENCOUNTERED																SAMPLE				TESTING	
				SOIL				ROCK													
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(†) DENSITY.(†)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH (VL L M H VH EH)	RECOVERY (%)	RQD	FRACTURE SPACING (m) (0.05 0.06 0.100 0.200 0.600)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
													PR, SN Fe, SM 14.34m: JT/20°, IR, VNR CA, RF 14.37m: JT/10°, IR, VNR Clay, RF, VNR CA 14.43m: JT/10°, IR, VNR CA, RF 14.47m: JT/10°, PR, SN Fe, SM 14.49m: JT/10°, IR, INF Clay, RF 14.54m: JT/10°, PR, SM 14.55m: JT/10°, IR, INF Clay, RF 14.58m: JT/30°, IR, VNR CA, RF 14.66m: JT/10°, IR, VNR Clay, RF 14.70m: JT/10°, PR, SN Fe, SM 14.76m: JT/10°, IR, VNR CA, RF 14.80m: JT/10°, PR, SN Fe, SM 14.85m: JT/10°, IR, VNR CA, RF, VNR CA 14.90m: JT/40°, PR, SN Fe, SM 14.94m: JT/10°, IR, VNR CA, RF 14.97m: JT/30°, PR, SN Fe, SM					

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NOTES: (#)Soil origin is "probable" unless otherwise stated. (†)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Gemco
OPERATOR: Q Drill
LOGGED: SP

METHOD: 115mm diameter solid flight auger to 5.5m, mud rotary to 13.14m
CASING: NW to 5.6m

REMARKS: No free groundwater observed during augering

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL Pty Limited
PROJECT: Copperstring - Proposed Substations and Transmission Line
LOCATION: Woodstock to Mt Isa, Woodstock, QLD
Kennedy Developmental Road, Hughenden

SURFACE LEVEL:
COORDINATE: E:205293.0, N:7688377.0
DATUM/GRID: MGA94 55K
DIP/AZIMUTH: 90°/---°

LOCATION ID: FLR500_OTP2_
PROJECT No: 200446.01
DATE: 19/09/23
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.00	Silty CLAY (CH), with gravel, trace sand: brown; high plasticity; fine to coarse gravel; fine sand.		ALV	F / St / H	w<PL		B		0.20	DCP9/100	5 10 15 15/40
								D		0.30		
								ES		0.40		
										0.50		
										0.60		
	0.80	Silty CLAY (CH): pale brown; high plasticity.						B		0.80		
	1	1.00m: calcite								1.00		
								SPT			SPT	9,15,17 N=32
										1.40		
										1.45		
								ES		1.60		
	2			RS	VSt	w<PL				2.00		
								SPT			SPT	9,12,13 N=25
										2.45		
	3				H					3.00		
								SPT			SPT	12,17,19 N=36
	3.45	Borehole discontinued at 3.45m depth. Limit of investigation.								3.45		
	4									4		

DRAFT

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: GT50
METHOD: 300mm diameter SFA to 1.5m, then 110mm diameter SFA
REMARKS: No free groundwater observed during augering

OPERATOR: Ground Test
CASING: Nil

LOGGED: DH

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BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Between Woodstock and Mt Isa

SURFACE LEVEL: 228 AHD
EASTING: 437533
NORTHING: 7706352
DIP/AZIMUTH: 90°/--

BORE No: DJR-BH1-K1
PROJECT No: 200446.01
DATE: 18/12/2023
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
228	0.3	Gravelly Sandy CLAY (CI): medium plasticity, red-brown, fine to coarse sand, fine to coarse gravel, w<PL, very stiff (residual)							B D E D			
227	1.0	Silty CLAY (CH): high plasticity, red-brown, with fine to medium sand, w<PL, hard (residual)							D S			14/75mm HB
	1.7	Sandy GRAVEL (GP): fine, pale brown, fine to coarse sand, with low plasticity clay, dry, very dense (residual)								100	21	
226	2.2	Gravelly Sandy CLAY (CL): low plasticity, grey, fine to coarse sand, fine gravel, w<PL, hard (residual)										
		Sandy GRAVEL (GP): fine, dark grey, fine to coarse sand, dry, very dense (residual)							S C			10/20mm HB
225	3.3	Gravelly Sandy CLAY (CI): medium plasticity, dark grey, fine to coarse sand, fine gravel, w<PL, hard (residual)										
224									S			11/50mm HB
223	5.0	BASALT: dark grey, very low strength, extremely weathered										
	5.3	BASALT: fine grained, dark grey, high strength, slightly weathered, with healed joints, crystalline, fractured - low to medium strength, highly to moderately weathered - medium to high strength, moderately weathered - low strength, highly weathered, with interbedded very low strength, extremely weathered clay seams - quartz band - interbedded quartz band, medium to high strength, moderately weathered						5.3m: 5.30-5.90:"J x 7, 30-40°, pl, ir, ro, cly, ven, at 0.03-0.09m spacing 5.5m: 5.50-5.63: J x 2, 60°, ir, pl, ro, cly, ven, at 0.05m spacing 5.6m: J, 10°, ir, ro, cly, ven 5.71m: 5.71-5.73: Cz, 5-30°, ir, ro, cly, ven 5.75m: J, 20°, ir, ro, cly, ven 5.8m: J, 30°, pl, ro, cln 5.94m: J, 10°, ir, ro, cly, inf 5.941m: 5.94-6.00: Cs, 5-30°, ir, ro, cly, inf 6.03m: 6.03-6.07: Cs, 5-30°, ir, ro, cly, inf 6.25m: 6.25-6.35: Cs, 5-30°, ir, ro, cly, inf 6.38m: J, 10°, ir, ro, cly, inf 6.43m: J, 10°, ir, ro, cly, ven 6.47m: 6.47-6.55: Cz, Cs, 5-30°, ir, ro, cly, inf 6.59m: J, 10°, ir, ro, cly, inf 6.66m: J, 15°, ir, ro, cly, ven 6.71m: J, 10°, ir, ro, cly, ven	C	100	0	
222	6								C	100	40	
221	7											PL(A) = 3.49 PL(D) = 4.26
220	8	- high to very high strength, slightly weathered, slightly fractured							C UCS	100	63	PL(A) = 3.32 PL(D) = 4.75
219	9	- with quartz veins and bands							C	100	90	PL(A) = 3.38 PL(D) = 2.2

DRAFT

RIG: Hydrapower Scout 5 **DRILLER:** Q Drill **LOGGED:** SP **CASING:** HW to 1.1m

TYPE OF BORING: 115mm diameter solid flight auger to 1.0m depth, washbore to 5.2m depth, then NMLC coring

WATER OBSERVATIONS: No free groundwater observed during augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Between Woodstock and Mt Isa

SURFACE LEVEL: 228 AHD
EASTING: 437533
NORTHING: 7706352
DIP/AZIMUTH: 90°/--

BORE No: DJR-BH1-K1
PROJECT No: 200446.01
DATE: 18/12/2023
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
218		BASALT: fine grained, dark grey, high strength, slightly weathered, with healed joints, crystalline, fractured *(continued)*						6.8m: 6.80-6.85: J, Cz, Cs, 5-40°, ir, ro, cly, inf 6.91m: J, 10°, ir, ro, cly, ven 6.94m: 6.94-7.04: J, 70-90°, ir, ro, fe, stn 7.07m: J, 10°, ir, ro, cly, ven 7.1m: J, 20°, ir, ro, cly, ven 7.32m: J, 20°, ir, ro, cly, ven, fe, stn 7.34m: J, 40°, ir, ro, cly, ven 7.4m: J, 10°, ir, ro, cly, ven 7.53m: J, 15°, ir, ro, cly inf 7.63m: J, 10°, ir, ro, cly inf 7.7m: J, 10°, ir, ro, cly, ven 7.73m: J, 10°, ir, ro, cly, ven 7.76m: J, 10°, ir, ro, cly, ven, fe, stn 7.8m: J, 10°, ir, ro, cly, ven, fe, stn 7.84m: J, 10°, ir, ro, cly, ven 7.87m: J, 70-90°, ir, ro, cly, ven 7.89m: 7.89-7.93: Cz, 10-70°, ir, ro, cly, ven 7.98m: J, 20°, ir, ro, cly, ven 8m: 8.00-8.06: J, 90°, ir, ro, cly, ven 8.03m: 8.06-8.11: Cs, 5-30°, ir, ro, cly, inf 8.12m: J, 30°, ir, ro, cly, ven 8.15m: J, 10°, ir, ro, cln 8.33m: 8.33-8.41: J, 60-90°, pl, ro, cln 8.37m: J, 10-20°, pl, ro, cln 8.73m: J, 40°, pl, ro, fe, stn 9.3m: J, 10°, ir, ro, cln 9.55m: J, 15°, ir, ro, cln 9.88m: 9.88-10.03: J x 3, 60-80°, pl, ir, ro, cln, at 0.03m spacing 10.03m: J, 10°, ir, ro, cln 10.18m: J, 10-20°, ir, ro, cln 10.47m: J, 10°, ir, ro, cln 10.52m: J, 10°, ir, ro, cln 10.72m: J, 60°, pl, ro, cln 10.83m: J, 10°, ir, ro, cln 11.12m: J, 10°, pl, ro, cln 11.19m: J, 10°, pl, ro, cln 11.44m: J, 30°, pl, ro, cln 11.65m: J, 20°, pl, ro, cln 11.93m: J, 15°, ir, ro, cln 12m: 12.00-12.05: J, 60°, pl, ro, cln	C	100	90	
217	11	- quartz bands							C	100	81	PL(A) = 3.86 PL(D) = 4.79 PL(A) = 3.55 PL(D) = 4.99
216	12 12.05	Bore discontinued at 12.05m depth - Limit of investigation										
215	13											
214	14											
213	15											
212	16											
211	17											
210	18											
209	19											

DRAFT

RIG: Hydrapower Scout 5 **DRILLER:** Q Drill **LOGGED:** SP **CASING:** HW to 1.1m

TYPE OF BORING: 115mm diameter solid flight auger to 1.0m depth, washbore to 5.2m depth, then NMLC coring

WATER OBSERVATIONS: No free groundwater observed during augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Between Woodstock and Mt Isa

SURFACE LEVEL: 228 AHD
EASTING: 437533
NORTHING: 7706352
DIP/AZIMUTH: 90°/--

BORE No: DJR-BH1-K1
PROJECT No: 200446.01
DATE: 18/12/2023
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
208												
								20.28m: J, 30-40°, pl, ro, cln				
207	21											
206	22											
205	23											
204	24											
203	25											
202	26											
201	27											
200	28											
199	29											

DRAFT

RIG: Hydrapower Scout 5 **DRILLER:** Q Drill **LOGGED:** SP **CASING:** HW to 1.1m

TYPE OF BORING: 115mm diameter solid flight auger to 1.0m depth, washbore to 5.2m depth, then NMLC coring

WATER OBSERVATIONS: No free groundwater observed during augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Between Woodstock and Mt Isa

SURFACE LEVEL: 228 AHD
EASTING: 437494
NORTHING: 7706348
DIP/AZIMUTH: 90°/--

BORE No: DJR-BH2-K1
PROJECT No: 200446.01
DATE: 10/1/2024
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
228	0.3	Gravelly Sandy CLAY (CL): low plasticity, dark red-brown, fine to medium sand, fine to medium gravel, with trace fine to medium quartz, trace organics, w<PL (residual)							D E			
		- no organics							D E			
227	1								D E			
	1.3	Gravelly CLAY (CI): medium plasticity, red-brown, with fine to medium sand, fine to medium gravel, w<PL (residual)							S			8,10,9 N = 19
		- pale red-brown							D E			
226	2	2.0 Gravelly Sandy CLAY (CI): medium plasticity, pale brown, fine to medium sand, fine to medium gravel, trace fine to medium quartz, w<PL, very stiff (residual)							D			
									D			
225	3	3.0 Clayey SAND (SC): fine to medium, grey, low plasticity clay, very dense (residual)							S			10,21,29 N = 50
		Rock: extremely weathered, with soil properties as Sandy CLAY (CI): medium plasticity, grey and dark grey, fine to medium sand, w<PL, hard										
224	4								S			10/40mm HB
223	5	- interbedded quartz banding, interbedded clay seam										
									S			15/75mm HB
222	6											
221	7								S			10/20mm HB
220	8											
	8.51	SCHIST: fine grained, grey and red-brown, high strength, slightly weathered, with ironstaining							S			~~10/10mm HB~~ PL(A) = 0.46 PL(D) = 0.3
219	9	- fractured, less ironstaining						8.57m: J, 20°, pl, ro, stn 8.58m: J, 10°, pl, ro, stn, cln 8.59m: J, 20°, pl, ro, stn 8.62m: J, 20°, pl, ro, stn 8.65m: J, 40°, pl, ro, stn 8.68m: J, 40°, pl, ro, stn, he 8.73m: J, 40°, pl, ro, stn 8.82m: J, 30°, pl, ro, stn,	C	100	38	PL(A) = 4.64

DRAFT

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** HWT toi 2.5m

TYPE OF BORING: 115mm diameter solid flight auger to 2.5m depth, then washbore to 8.51m depth, then NMLC coring

WATER OBSERVATIONS: No free groundwater observed during augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: UGL CPB JV
PROJECT: Copperstring 2032 Project
LOCATION: Between Woodstock and Mt Isa

SURFACE LEVEL: 228 AHD
EASTING: 437494
NORTHING: 7706348
DIP/AZIMUTH: 90°/--

BORE No: DJR-BH2-K1
PROJECT No: 200446.01
DATE: 10/1/2024
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
218		SCHIST: fine grained, grey and red-brown, high strength, slightly weathered, with ironstaining *(continued)*						cln 8.852m: J, 60°, pl, ro, stn, cln 8.88m: J, 10°, pl, ro, stn 8.94m: J, 30°, pl, ro, stn 9.08m: J, 10°, ir, ro, stn, cln 9.12m: J, 70°, pl, ro, stn, cln 9.121m: J, 90°, pl, ro, stn, cln 9.13m: J, 20°, pl, ro, stn, cln 9.16m: J, 30°, pl, ro, stn, vr, cz 9.26m: J, 20°, st, ro, cln 9.38m: J, 10°, pl, ro, stn, he 9.43m: J, 10°, pl, ro, stn, cln 9.49m: J, 20°, ir, ro, cln 9.71m: J, 10°, ir, ro, cln 9.89m: J, 20°, pl, ro, stn 9.95m: J, 10°, pl, ro, stn, cln 10.09m: J, 30°, pl, ro, stn, cln 10.13m: J, 60°, pl, ro, stn, cln 10.25m: J, 60°, pl, ro, stn, cln	C	100	40	PL(D) = 2.15
217	11								C	100	88	PL(A) = 4.73 PL(D) = 4.29
216	11.85 12	BASALT: fine grained, grey and dark grey, high to very high strength, slightly weathered, slightly fractured										PL(D) = 3.88 PL(D) = 3.88
215	13											
214	14											PL(D) = 3.88
	14.25	Bore discontinued at 14.25m depth - Limit of investigation						10.44m: J, 30°, st, ro, cln 10.62m: J, 20°, pl, ro, stn, cln 10.77m: J, 30°, pl, ro, stn, cln 10.85m: J, 30°, pl, ro, stn, cln 11.05m: J, 30°, pl, ro, stn, cln 11.09m: J, 30°, pl, ro, stn, cln 11.2m: J, 10°, pl, ro, stn, cln 11.46m: J, 20°, pl, ro, stn 11.7m: J, 10°, pl, ro, stn 11.85m: J, 45°, pl, ro, stn, vr, cly 11.92m: J, 30°, pl, ro, stn, vr, cly 12.11m: J, 45°, pl, ro, stn, vr, cly 12.13m: J, 70°, pl, ro, stn, vr, cly 12.53m: J, 20°, st, ro, stn 12.93m: J, 10°, pl, ro, stn 13.03m: J, 40°, pl, ro, stn 13.1m: J, 20°, pl, ro, stn 13.67m: J, 10°, ir, ro, stn 13.86m: J, 60°, pl, ro, stn, vr, cly 14.11m: J, 60°, ir, ro, stn				
213	15											
212	16											
211	17											
210	18											
209	19											

DRAFT

RIG: Hydrapower Scout 5 **DRILLER:** Ground Test **LOGGED:** DU **CASING:** HWT toi 2.5m

TYPE OF BORING: 115mm diameter solid flight auger to 2.5m depth, then washbore to 8.51m depth, then NMLC coring

WATER OBSERVATIONS: No free groundwater observed during augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

Appendix G

Laboratory Reports and Chain of Custody Documentation

CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

☐ **Sydney Laboratory** Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com

☑ **Brisbane Laboratory** Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory** Unit 2 91 Leach Highway Kewdale WA 6105 08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory** 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Cloncurry	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter
Handed over by	Luke Baxter
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses: Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers: Change container type & size if necessary.

Required Turnaround Time (TAT): Default will be 5 days if not ticked.

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

10399930

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	Clo-BH1/ 0.0 - 0.2	21/10/23	S	X												
2	Clo-BH1/ 0.3 - 0.5	21/10/23	S													
3	Clo-BH1/ / 0.8 - 1.0	21/10/23	S													
4	Clo-BH1/ 1.3 - 1.5	21/10/23	S													
5	Clo-BH2/ 0.0 - 0.2	21/10/23	S	X												
6	Clo-BH2/ 0.3 - 0.5	21/10/23	S													
7	Clo-BH2/ 0.8 - 1.0	21/10/23	S													
8	Clo-BH2/ 1.3 - 1.5	21/10/23	S													
9																
10																
			Total Counts	2												

Date/Time: 27/10/23 10:30am
Chilled: Yes / No
Temp:
Correction: 14.7
Final Temp:

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Name	Signature	Date	Time

Eurofins | mgt Laboratory Use Only							
Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature
Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

☐ **Sydney Laboratory** Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com

☑ **Brisbane Laboratory** Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory** Unit 2 91 Leach Highway Kewdale WA 6105 08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory** 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Cloncurry	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter
Handed over by	Luke Baxter
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Containers (Change container type & size if necessary.)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked.)

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Analyses: Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	Clo-BH3/ 0.0 - 0.2	21/10/23	S	✖		✖										
2	Clo-BH3/ 0.3 - 0.5	21/10/23	S													
3	Clo-BH3/ / 0.8 - 1.0	21/10/23	S													
4	Clo-BH3/ 1.3 - 1.5	21/10/23	S													
5	Clo-BH4/ 0.0 - 0.2	20/10/23	S	✖												
6	Clo-BH4/ 0.3 - 0.5	20/10/23	S													
7	Clo-BH4/ 0.8 - 1.0	20/10/23	S													
8	Clo-BH4/ 1.3 - 1.5	20/10/23	S													
9																
10																
		Total Counts		2		1										

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal Name Signature Date Time

Eurofins | mgt Laboratory Use Only						
Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature	
Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №	

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Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

☐ **Sydney Laboratory**
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☑ **Brisbane Laboratory**
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Cloncurry	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter	
Handed over by	Luke Baxter	
Email for Invoice	apinvoices@douglaspartners.com.au	
Email for Results	Dawit.Bekele@douglaspartners.com.au	

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	Clo-BH5/ 0.0- 0.2	20/10/23	S	X												
2	Clo-BH5/ 0.3 -0.5	20/10/23	S													
3	Clo-BH5/ /0.8 -1.0	20/10/23	S													
4	Clo-BH5/ 1.3 - 1.5	20/10/23	S													
5	Clo-BH6/ 0.0 - 0.2	20/10/23	S	X												
6	Clo-BH6/ 0.3 - 0.5	20/10/23	S													
7	Clo-BH6/ /0.8 - 1.0	20/10/23	S													
8	Clo-BH6/ 1.3 - 1.5	20/10/23	S													
9																
10																
		Total Counts		2												

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal — Name | Signature | Date | Time

Eurofins | mgt Laboratory Use Only

Received By | SYD | BNE | MEL | PER | ADL | NTL | DRW | Signature | Date | Time | Temperature

Received By | SYD | BNE | MEL | PER | ADL | NTL | DRW | Signature | Date | Time | Report №

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CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

☐ **Sydney Laboratory** Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com

☑ **Brisbane Laboratory** Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory** Unit 2 91 Leach Highway Kewdale WA 6105 08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory** 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Cloncurry	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter
Handed over by	Luke Baxter
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦ ☐ Same day♦ ☐ 1 day♦ ☐ 2 days♦ ☐ 3 days♦ ☑ 5 days (Standard) ☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	Clo-BH7/ 0.0- 0.2	21/10/23	S	X												
2	Clo-BH7/ 0.3 - 0.5	21/10/23	S													
3	Clo-BH7/ / 0.8 - 1.0	21/10/23	S													
4	Clo-BH7/ 1.3 - 1.5	21/10/23	S													
5	Clo-BH8/ 0.0 - 0.2	21/10/23	S	X												
6	Clo-BH8/ 0.3 - 0.5	21/10/23	S													
7	Clo-BH8/ /1.0 - 1.2	21/10/23	S													
8	Clo-BH8/ 1.3 - 1.4	21/10/23	S													
9																
10																
			Total Counts	2												

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

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Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☑ **Brisbane Laboratory**
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Cloncurry	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter
Handed over by	Luke Baxter
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

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☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	Clo-BH9/ 0.0 -0.1	21/10/23	S	X												
2	Clo-BH9/ 0.4 - 0.6	21/10/23	S													
3	Clo-BH9/ / 0.8 -1.0	21/10/23	S													
4	Clo-BH9/ 1.3 - 1.5	21/10/23	S													
5	Clo-BH10/ 0.0 - 0.2	21/10/23	S	X		X										
6	Clo-BH10/ 0.3 - 0.5	21/10/23	S													
7	Clo-BH10/ 0.8 - 1.0	21/10/23	S													
8	Clo-BH10/ 1.3 - 1.5	21/10/23	S													
9																
10																
		Total Counts		2		1										

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal — Name | Signature | Date | Time

Eurofins | mgt Laboratory Use Only

Received By | SYD | BNE | MEL | PER | ADL | NTL | DRW | Signature | Date | Time | Temperature

Received By | SYD | BNE | MEL | PER | ADL | NTL | DRW | Signature | Date | Time | Report №

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03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Cloncurry	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter	
Handed over by	Luke Baxter	
Email for Invoice	apinvoices@douglaspartners.com.au	
Email for Results	Dawit.Bekele@douglaspartners.com.au	

Containers (Change container type & size if necessary.)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked.)

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- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	Clo-BH11/ 0.0 - 0.2	21/10/23	S													
2	Clo-BH11/ 0.2 - 0.5	21/10/23	S													
3	Clo-BH11/ / 0.5 - 0.7	21/10/23	S	X												
4	Clo-BH12/ 0.0 - 0.2	21/10/23	S	X												
5	Clo-BH12/ 0.3 - 0.5	21/10/23	S													
6	Clo-BH12/ 0.8 - 1.0	21/10/23	S													
7	Clo-BH12/ 1.3 -1.5	21/10/23	S													
8																
9																
10																
	Total Counts			2												

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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6 Monterey Road Dandenong South VIC 3175
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Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Cloncurry	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter	
Handed over by	Luke Baxter	
Email for Invoice	apinvoices@douglaspartners.com.au	
Email for Results	Dawit.Bekele@douglaspartners.com.au	

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- ☐ 2 days♦ ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

Analyses (Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	R1	21/10/23	S													
2	S1	21/10/23	S													
3	R2	21/10/23	S													
4	S2	21/10/23	S													
5	R3	22/10/23	S		X											
6	S3	22/10/23	S													Please send this sample to ALS
7	Tirp Blank						X									
8	Trip Spike						X									
9																
10																
	Total Counts				1		2									

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	

Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd

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Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Christchurch	Tauranga
35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	Douglas Partners (Qld) Pty Ltd
Contact name:	Dawit Bekele
Project name:	COPPPERSTRING 2.0 PROJECT- CLONCURRY
Project ID:	200445.02
Turnaround time:	5 Day
Date/Time received	Oct 27, 2023 10:30 AM
Eurofins reference	1039930

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✓	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Please note: Additional sample CLO-BH9/ 01-0.3 was received by laboratory, sample has been placed on hold, Additional bags were received, firstly, CLO-BH11/0.2-0.2, and secondly, with no bore hole mentioned was also received, bag is marked "0.1-0.3" samples have been placed on hold. Trip blank was not received by laboratory. Sample has been forwarded to ALS as requested.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Zoe Flynn on phone : or by email: ZoeFlynn@eurofins.com

Results will be delivered electronically via email to Dawit Bekele - Dawit.Bekele@douglaspartners.com.au.

Note: A copy of these results will also be delivered to the general Douglas Partners (Qld) Pty Ltd email address.

Douglas Partners Pty Ltd
439 Montague Road
West End
QLD 4101

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Dawit Bekele**

Report **1039930-S**
Project name COPPPERSTRING 2.0 PROJECT- CLONCURRY
Project ID 200445.02
Received Date Oct 27, 2023

Client Sample ID			**CLO- BH1/ 0.0-0.2**	**CLO- BH2/ 0.0-0.2**	**CLO- BH3/ 0.0-0.2**	**CLO- BH4/ 0.0-0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0074795**	**B23-Oc0074796**	**B23-Oc0074797**	**B23-Oc0074798**
Date Sampled			**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	90	95	86	102
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			CLO- BH1/ 0.0-0.2	CLO- BH2/ 0.0-0.2	CLO- BH3/ 0.0-0.2	CLO- BH4/ 0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0074795	B23-Oc0074796	B23-Oc0074797	B23-Oc0074798
Date Sampled			Oct 21, 2023	Oct 21, 2023	Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	75	83	109	102
p-Terphenyl-d14 (surr.)	1	%	64	75	102	96
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	71	77	108	100
Tetrachloro-m-xylene (surr.)	1	%	73	82	110	103
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			CLO- BH1/ 0.0-0.2	CLO- BH2/ 0.0-0.2	CLO- BH3/ 0.0-0.2	CLO- BH4/ 0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0074795	B23-Oc0074796	B23-Oc0074797	B23-Oc0074798
Date Sampled			Oct 21, 2023	Oct 21, 2023	Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	61	67	99	89
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	71	77	108	100
Tetrachloro-m-xylene (surr.)	1	%	73	82	110	103
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1

Client Sample ID			CLO- BH1/ 0.0-0.2	CLO- BH2/ 0.0-0.2	CLO- BH3/ 0.0-0.2	CLO- BH4/ 0.0-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0074795**	**B23-Oc0074796**	**B23-Oc0074797**	**B23-Oc0074798**
Date Sampled			**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	69	78	101	91
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	2.4	3.5	2.4	3.0
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	39	34	51	34
Copper	5	mg/kg	31	39	44	36
Lead	5	mg/kg	< 5	< 5	< 5	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	18	16	22	16
Zinc	5	mg/kg	15	14	15	12
Sample Properties						
% Moisture	1	%	9.2	26	1.9	10
Crystalline Silica			-	-	See Attached	-

Client Sample ID			CLO- BH5/ 0.0-0.2	CLO- BH6/ 0.0-0.2	CLO- BH7/ 0.0-0.2	CLO- BH8/ 0.0-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0074799**	**B23-Oc0074800**	**B23-Oc0074801**	**B23-Oc0074802**
Date Sampled			**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50

Client Sample ID			CLO- BH5/ 0.0-0.2	CLO- BH6/ 0.0-0.2	CLO- BH7/ 0.0-0.2	CLO- BH8/ 0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0074799	B23-Oc0074800	B23-Oc0074801	B23-Oc0074802
Date Sampled			Oct 21, 2023	Oct 21, 2023	Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	108	99	80	93
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	108	104	110	104
p-Terphenyl-d14 (surr.)	1	%	110	102	104	103
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			CLO- BH5/ 0.0-0.2	CLO- BH6/ 0.0-0.2	CLO- BH7/ 0.0-0.2	CLO- BH8/ 0.0-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0074799**	**B23-Oc0074800**	**B23-Oc0074801**	**B23-Oc0074802**
Date Sampled			**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	96	101	118	93
Tetrachloro-m-xylene (surr.)	1	%	117	107	113	111
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			CLO- BH5/ 0.0-0.2	CLO- BH6/ 0.0-0.2	CLO- BH7/ 0.0-0.2	CLO- BH8/ 0.0-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0074799**	**B23-Oc0074800**	**B23-Oc0074801**	**B23-Oc0074802**
Date Sampled			**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	92	95	101	92
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	96	101	118	93
Tetrachloro-m-xylene (surr.)	1	%	117	107	113	111
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	100	94	100	97
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	2.8	2.3	3.2	3.0
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	28	36	53	49
Copper	5	mg/kg	24	28	28	26

Client Sample ID			CLO- BH5/ 0.0-0.2	CLO- BH6/ 0.0-0.2	CLO- BH7/ 0.0-0.2	CLO- BH8/ 0.0-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0074799**	**B23-Oc0074800**	**B23-Oc0074801**	**B23-Oc0074802**
Date Sampled			**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	< 5	5.3	< 5	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	12	37	20	20
Zinc	5	mg/kg	11	22	11	11
Sample Properties						
% Moisture	1	%	1.5	1.3	2.8	2.7

Client Sample ID			CLO- BH9/ 0.0-0.1	CLO- BH10/ 0.0-0.2	CLO-BH11/0.5-0.7	CLO- BH12/ 0.0-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0074803**	**B23-Oc0074804**	**B23-Oc0074805**	**B23-Oc0074806**
Date Sampled			**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	130	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	160	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	290	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	84	86	91	100
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	100	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			CLO- BH9/ 0.0-0.1	CLO- BH10/ 0.0-0.2	CLO-BH11/0.5-0.7	CLO- BH12/ 0.0-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0074803**	**B23-Oc0074804**	**B23-Oc0074805**	**B23-Oc0074806**
Date Sampled			**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	106	102	108	103
p-Terphenyl-d14 (surr.)	1	%	105	98	106	104
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	102	90	111	100
Tetrachloro-m-xylene (surr.)	1	%	112	108	114	111
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			CLO- BH9/ 0.0-0.1	CLO- BH10/ 0.0-0.2	CLO-BH11/0.5-0.7	CLO- BH12/ 0.0-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0074803**	**B23-Oc0074804**	**B23-Oc0074805**	**B23-Oc0074806**
Date Sampled			**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**	**Oct 21, 2023**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	98	88	96	91
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	102	90	111	100
Tetrachloro-m-xylene (surr.)	1	%	112	108	114	111
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1

Client Sample ID			CLO- BH9/ 0.0-0.1	CLO- BH10/ 0.0-0.2	CLO-BH11/0.5-0.7	CLO- BH12/ 0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0074803	B23-Oc0074804	B23-Oc0074805	B23-Oc0074806
Date Sampled			Oct 21, 2023	Oct 21, 2023	Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	99	93	99	96
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	100	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	180	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	280	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	36	3.2	< 2	3.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	250	35	49	26
Copper	5	mg/kg	77	24	8.5	20
Lead	5	mg/kg	120	< 5	< 5	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	210	12	38	11
Zinc	5	mg/kg	83	6.5	29	10.0
Sample Properties						
% Moisture	1	%	95	3.5	5.9	17
Crystalline Silica			-	See Attached	-	-

Client Sample ID			R3	TRIP SPIKE
Sample Matrix			Soil	Trip Spike (solid)
Eurofins Sample No.			B23-Oc0074807	B23-Oc0074808
Date Sampled			Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	-
TRH C10-C14	20	mg/kg	< 20	-
TRH C15-C28	50	mg/kg	< 50	-
TRH C29-C36	50	mg/kg	< 50	-
TRH C10-C36 (Total)	50	mg/kg	< 50	-

Client Sample ID			R3	TRIP SPIKE
Sample Matrix			Soil	Trip Spike (solid)
Eurofins Sample No.			B23-Oc0074807	B23-Oc0074808
Date Sampled			Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit		
BTEX				
Benzene	0.1	mg/kg	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	-
Xylenes - Total*	0.3	mg/kg	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	98	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-
TRH C6-C10	20	mg/kg	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	97	-
p-Terphenyl-d14 (surr.)	1	%	94	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	50	mg/kg	< 50	-
TRH >C16-C34	100	mg/kg	< 100	-
TRH >C34-C40	100	mg/kg	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-
Heavy Metals				
Arsenic	2	mg/kg	< 2	-
Cadmium	0.4	mg/kg	< 0.4	-
Chromium	5	mg/kg	58	-
Copper	5	mg/kg	9.6	-
Lead	5	mg/kg	< 5	-
Mercury	0.1	mg/kg	< 0.1	-
Nickel	5	mg/kg	42	-
Zinc	5	mg/kg	31	-

Client Sample ID			R3	TRIP SPIKE
Sample Matrix			Soil	Trip Spike (solid)
Eurofins Sample No.			B23-Oc0074807	B23-Oc0074808
Date Sampled			Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit		
Sample Properties				
% Moisture	1	%	6.7	-
Naphthalene	1	%	-	62
TRH C6-C10	1	%	-	53
TRH C6-C9	1	%	-	51
BTEX				
Benzene	1	%	-	46
Ethylbenzene	1	%	-	50
m&p-Xylenes	1	%	-	52
o-Xylene	1	%	-	51
Toluene	1	%	-	49
Xylenes - Total	1	%	-	51
4-Bromofluorobenzene (surr.)	1	%	-	82

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Nov 02, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Nov 02, 2023	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 02, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Nov 02, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Sydney	Nov 02, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Sydney	Nov 02, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 02, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Sydney	Nov 02, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B15			
Organochlorine Pesticides	Sydney	Nov 03, 2023	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Nov 02, 2023	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Sydney	Nov 02, 2023	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
% Moisture	Sydney	Oct 31, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Crystalline Silica	Melbourne	Oct 31, 2023	10 Days
- Method:			

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Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
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Order No.:
Report #: 1039930
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Oct 27, 2023 10:30 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPPERSTRING 2.0 PROJECT- CLONCURRY
Project ID: 200445.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X	X
External Laboratory						X							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	CLO- BH1/ 0.0-0.2	Oct 21, 2023		Soil	B23-Oc0074795			X	X		X		
2	CLO- BH2/ 0.0-0.2	Oct 21, 2023		Soil	B23-Oc0074796			X	X		X		
3	CLO- BH3/ 0.0-0.2	Oct 21, 2023		Soil	B23-Oc0074797	X		X	X		X		
4	CLO- BH4/ 0.0-0.2	Oct 21, 2023		Soil	B23-Oc0074798			X	X		X		
5	CLO- BH5/ 0.0-0.2	Oct 21, 2023		Soil	B23-Oc0074799			X	X		X		
6	CLO- BH6/ 0.0-0.2	Oct 21, 2023		Soil	B23-Oc0074800			X	X		X		
7	CLO- BH7/	Oct 21, 2023		Soil	B23-Oc0074801			X	X		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Received: Oct 27, 2023 10:30 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPPERSTRING 2.0 PROJECT- CLONCURRY
Project ID: 200445.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X	X
	0.0-0.2												
8	CLO- BH8/ 0.0-0.2	Oct 21, 2023		Soil	B23-Oc0074802			X	X		X		
9	CLO- BH9/ 0.0-0.1	Oct 21, 2023		Soil	B23-Oc0074803			X	X		X		
10	CLO- BH10/ 0.0-0.2	Oct 21, 2023		Soil	B23-Oc0074804	X		X	X		X		
11	CLO- BH11/0.5-0.7	Oct 21, 2023		Soil	B23-Oc0074805			X	X		X		
12	CLO- BH12/ 0.0-0.2	Oct 21, 2023		Soil	B23-Oc0074806			X	X		X		
13	R3	Oct 21, 2023		Soil	B23-Oc0074807				X	X			
14	TRIP SPIKE	Oct 21, 2023		Trip Spike (solid)	B23-Oc0074808							X	X
15	CLO-BH1/0.4-0.5	Oct 21, 2023		Soil	B23-Oc0074809		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Received: Oct 27, 2023 10:30 AM
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Project Name: COPPPERSTRING 2.0 PROJECT- CLONCURRY
Project ID: 200445.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X	X
16	CLO-BH1/0.8-1.0	Oct 21, 2023		Soil	B23-Oc0074810		X						
17	CLO- BH1/ 1.3-1.5	Oct 21, 2023		Soil	B23-Oc0074811		X						
18	CLO-BH2/0.4-0.5	Oct 21, 2023		Soil	B23-Oc0074812		X						
19	CLO-BH2/0.8-1.0	Oct 21, 2023		Soil	B23-Oc0074813		X						
20	CLO- BH2/ 1.3-1.5	Oct 21, 2023		Soil	B23-Oc0074814		X						
21	CLO-BH3/0.4-0.5	Oct 21, 2023		Soil	B23-Oc0074815		X						
22	CLO-BH3/0.8-1.0	Oct 21, 2023		Soil	B23-Oc0074816		X						
23	CLO- BH3/ 1.3-1.5	Oct 21, 2023		Soil	B23-Oc0074817		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Project ID: 200445.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X	X
24	CLO-BH4/0.4-0.5	Oct 21, 2023		Soil	B23-Oc0074818		X						
25	CLO-BH4/0.8-1.0	Oct 21, 2023		Soil	B23-Oc0074819		X						
26	CLO- BH4/ 1.3-1.5	Oct 21, 2023		Soil	B23-Oc0074820		X						
27	CLO-BH5/0.4-0.5	Oct 21, 2023		Soil	B23-Oc0074821		X						
28	CLO-BH5/0.8-1.0	Oct 21, 2023		Soil	B23-Oc0074822		X						
29	CLO- BH5/ 1.3-1.5	Oct 21, 2023		Soil	B23-Oc0074823		X						
30	CLO-BH6/0.4-0.5	Oct 21, 2023		Soil	B23-Oc0074824		X						
31	CLO-BH6/0.8-1.0	Oct 21, 2023		Soil	B23-Oc0074825		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Received: Oct 27, 2023 10:30 AM
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Contact Name: Dawit Bekele

Project Name: COPPPERSTRING 2.0 PROJECT- CLONCURRY
Project ID: 200445.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X	X
32	CLO- BH6/ 1.3-1.5	Oct 21, 2023		Soil	B23-Oc0074826		X						
33	CLO-BH7/0.4-0.5	Oct 21, 2023		Soil	B23-Oc0074827		X						
34	CLO-BH7/0.8-1.0	Oct 21, 2023		Soil	B23-Oc0074828		X						
35	CLO- BH7/ 1.3-1.5	Oct 21, 2023		Soil	B23-Oc0074829		X						
36	CLO-BH8/0.4-0.5	Oct 21, 2023		Soil	B23-Oc0074830		X						
37	CLO-BH8/1.0-1.2	Oct 21, 2023		Soil	B23-Oc0074831		X						
38	CLO- BH8/ 1.3-1.5	Oct 21, 2023		Soil	B23-Oc0074832		X						
39	CLO-BH9/0.4-0.6	Oct 21, 2023		Soil	B23-Oc0074833		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X	X
40	CLO-BH9/0.8-1.0	Oct 21, 2023		Soil	B23-Oc0074834		X						
41	CLO- BH9/ 1.3-1.5	Oct 21, 2023		Soil	B23-Oc0074835		X						
42	CLO-BH10/0.4-0.5	Oct 21, 2023		Soil	B23-Oc0074836		X						
43	CLO-BH10/0.8-1.0	Oct 21, 2023		Soil	B23-Oc0074837		X						
44	CLO- BH10/ 1.3-1.5	Oct 21, 2023		Soil	B23-Oc0074838		X						
45	CLO- BH11/ 0.0-0.2	Oct 21, 2023		Soil	B23-Oc0074839		X						
46	CLO-BH11/0.4-0.5	Oct 21, 2023		Soil	B23-Oc0074840		X						
47	CLO-BH12/0.4-0.5	Oct 21, 2023		Soil	B23-Oc0074841		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X	X
48	CLO-BH12/0.8-1.0	Oct 21, 2023		Soil	B23-Oc0074842		X						
49	CLO- BH12/ 1.3-1.5	Oct 21, 2023		Soil	B23-Oc0074843		X						
50	R1	Oct 21, 2023		Soil	B23-Oc0074844		X						
51	S1	Oct 21, 2023		Soil	B23-Oc0074845		X						
52	R2	Oct 21, 2023		Soil	B23-Oc0074846		X						
53	S2	Oct 21, 2023		Soil	B23-Oc0074847		X						
54	CLO-BH9/0.1-0.3	Oct 21, 2023		Soil	B23-Oc0074848		X						
55	EXTRA BAG 0.1-0.3	Oct 21, 2023		Soil	B23-Oc0074865			X	X		X		
56	CLO- BH11/ 0.2-0.5	Oct 21, 2023		Soil	B23-Oc0074880		X						
Test Counts						2	41	13	14	1	13	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30%; however the following acceptance guidelines are equally applicable: Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported, have been reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 10			10	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Nitrophenol	mg/kg	< 1			1	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Total Non-Halogenated Phenol*	mg/kg	-			20	N/A	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	98			70-130	Pass	
TRH C10-C14	%	125			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	103			70-130	Pass	
Toluene	%	117			70-130	Pass	
Ethylbenzene	%	108			70-130	Pass	
m&p-Xylenes	%	112			70-130	Pass	
o-Xylene	%	110			70-130	Pass	
Xylenes - Total*	%	111			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	101			70-130	Pass	
TRH C6-C10	%	97			70-130	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	88			70-130	Pass	
Acenaphthylene	%	86			70-130	Pass	
Anthracene	%	86			70-130	Pass	
Benz(a)anthracene	%	85			70-130	Pass	
Benzo(a)pyrene	%	85			70-130	Pass	
Benzo(b&j)fluoranthene	%	78			70-130	Pass	
Benzo(g.h.i)perylene	%	96			70-130	Pass	
Benzo(k)fluoranthene	%	84			70-130	Pass	
Chrysene	%	84			70-130	Pass	
Dibenz(a.h)anthracene	%	88			70-130	Pass	
Fluoranthene	%	82			70-130	Pass	
Fluorene	%	85			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	91			70-130	Pass	
Naphthalene	%	85			70-130	Pass	
Phenanthrene	%	84			70-130	Pass	
Pyrene	%	83			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	73			70-130	Pass	
4.4'-DDD	%	82			70-130	Pass	
4.4'-DDE	%	81			70-130	Pass	
4.4'-DDT	%	96			70-130	Pass	
a-HCH	%	78			70-130	Pass	
Aldrin	%	76			70-130	Pass	
b-HCH	%	84			70-130	Pass	
d-HCH	%	81			70-130	Pass	
Dieldrin	%	83			70-130	Pass	
Endosulfan I	%	77			70-130	Pass	
Endosulfan II	%	90			70-130	Pass	
Endosulfan sulphate	%	89			70-130	Pass	
Endrin	%	91			70-130	Pass	
Endrin aldehyde	%	100			70-130	Pass	
Endrin ketone	%	92			70-130	Pass	
g-HCH (Lindane)	%	79			70-130	Pass	
Heptachlor	%	77			70-130	Pass	
Heptachlor epoxide	%	74			70-130	Pass	
Hexachlorobenzene	%	78			70-130	Pass	
Methoxychlor	%	97			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	101			70-130	Pass	
Dimethoate	%	106			70-130	Pass	
Ethion	%	99			70-130	Pass	
Fenitrothion	%	74			70-130	Pass	
Methyl parathion	%	99			70-130	Pass	
Mevinphos	%	102			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1016	%	75			70-130	Pass	
Aroclor-1260	%	73			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	86			25-140	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4-Dichlorophenol	%	87			25-140	Pass	
2.4.5-Trichlorophenol	%	81			25-140	Pass	
2.4.6-Trichlorophenol	%	92			25-140	Pass	
2.6-Dichlorophenol	%	85			25-140	Pass	
4-Chloro-3-methylphenol	%	88			25-140	Pass	
Pentachlorophenol	%	70			25-140	Pass	
Tetrachlorophenols - Total	%	79			25-140	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	76			25-140	Pass	
2-Methyl-4.6-dinitrophenol	%	71			25-140	Pass	
2-Nitrophenol	%	83			25-140	Pass	
2.4-Dimethylphenol	%	82			25-140	Pass	
2-Methylphenol (o-Cresol)	%	89			25-140	Pass	
3&4-Methylphenol (m&p-Cresol)	%	89			25-140	Pass	
4-Nitrophenol	%	82			25-140	Pass	
Dinoseb	%	76			25-140	Pass	
Phenol	%	90			25-140	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	123			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	93			80-120	Pass	
Cadmium	%	97			80-120	Pass	
Chromium	%	97			80-120	Pass	
Copper	%	96			80-120	Pass	
Lead	%	97			80-120	Pass	
Mercury	%	107			80-120	Pass	
Nickel	%	96			80-120	Pass	
Zinc	%	96			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S23-No0005416	NCP	%	89			70-130	Pass	
TRH C10-C14	S23-Oc0073761	NCP	%	105			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S23-No0005416	NCP	%	92			70-130	Pass	
Toluene	S23-No0005416	NCP	%	89			70-130	Pass	
Ethylbenzene	S23-No0005416	NCP	%	86			70-130	Pass	
m&p-Xylenes	S23-No0005416	NCP	%	90			70-130	Pass	
o-Xylene	S23-No0005416	NCP	%	83			70-130	Pass	
Xylenes - Total*	S23-No0005416	NCP	%	88			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S23-Oc0063824	NCP	%	92			70-130	Pass	
TRH C6-C10	S23-No0005416	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S23-Oc0071238	NCP	%	107			70-130	Pass	
Acenaphthylene	S23-Oc0071238	NCP	%	105			70-130	Pass	
Anthracene	S23-Oc0071238	NCP	%	110			70-130	Pass	
Benz(a)anthracene	S23-Oc0071238	NCP	%	107			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(a)pyrene	S23-Oc0071238	NCP	%	109			70-130	Pass	
Benzo(b&j)fluoranthene	S23-Oc0071238	NCP	%	101			70-130	Pass	
Benzo(g.h.i)perylene	S23-Oc0071238	NCP	%	119			70-130	Pass	
Benzo(k)fluoranthene	S23-Oc0071238	NCP	%	115			70-130	Pass	
Chrysene	S23-Oc0071238	NCP	%	112			70-130	Pass	
Dibenz(a.h)anthracene	S23-Oc0071238	NCP	%	121			70-130	Pass	
Fluoranthene	S23-Oc0071238	NCP	%	109			70-130	Pass	
Fluorene	S23-Oc0071238	NCP	%	109			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S23-Oc0071238	NCP	%	122			70-130	Pass	
Naphthalene	S23-Oc0071238	NCP	%	108			70-130	Pass	
Phenanthrene	S23-Oc0071238	NCP	%	108			70-130	Pass	
Pyrene	S23-Oc0071238	NCP	%	112			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S23-No0011448	NCP	%	114			70-130	Pass	
Dimethoate	S23-No0011448	NCP	%	103			70-130	Pass	
Ethion	S23-No0011448	NCP	%	90			70-130	Pass	
Methyl parathion	S23-No0011448	NCP	%	74			70-130	Pass	
Mevinphos	S23-No0011448	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	S23-Oc0071238	NCP	%	106			30-130	Pass	
2.4-Dichlorophenol	S23-Oc0071238	NCP	%	104			30-130	Pass	
2.4.5-Trichlorophenol	S23-Oc0071238	NCP	%	106			30-130	Pass	
2.4.6-Trichlorophenol	S23-Oc0071238	NCP	%	103			30-130	Pass	
2.6-Dichlorophenol	S23-Oc0071238	NCP	%	106			30-130	Pass	
4-Chloro-3-methylphenol	S23-Oc0071238	NCP	%	103			30-130	Pass	
Pentachlorophenol	S23-Oc0071238	NCP	%	89			30-130	Pass	
Tetrachlorophenols - Total	S23-Oc0071238	NCP	%	102			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	S23-Oc0071238	NCP	%	103			30-130	Pass	
2-Methyl-4.6-dinitrophenol	S23-Oc0071238	NCP	%	89			30-130	Pass	
2-Nitrophenol	S23-Oc0071238	NCP	%	105			30-130	Pass	
2.4-Dimethylphenol	S23-Oc0071238	NCP	%	104			30-130	Pass	
2-Methylphenol (o-Cresol)	S23-Oc0071238	NCP	%	103			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	S23-Oc0071238	NCP	%	102			30-130	Pass	
4-Nitrophenol	S23-Oc0071238	NCP	%	98			30-130	Pass	
Dinoseb	S23-Oc0071238	NCP	%	104			30-130	Pass	
Phenol	S23-Oc0071238	NCP	%	106			30-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S23-Oc0073761	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S23-No0005052	NCP	%	94			75-125	Pass	
Cadmium	S23-No0005052	NCP	%	100			75-125	Pass	
Chromium	S23-No0005052	NCP	%	95			75-125	Pass	
Copper	S23-No0005052	NCP	%	94			75-125	Pass	
Lead	S23-No0005052	NCP	%	97			75-125	Pass	
Mercury	S23-No0005052	NCP	%	109			75-125	Pass	
Nickel	S23-No0005052	NCP	%	96			75-125	Pass	
Zinc	S23-No0005052	NCP	%	90			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S23-No0001801	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S23-No0007365	NCP	mg/kg	35	23	40	30%	Fail	Q15
TRH C15-C28	S23-No0007365	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S23-No0007365	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S23-No0001801	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S23-No0001801	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S23-No0001801	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S23-No0001801	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S23-No0001801	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S23-No0001801	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S23-No0001801	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S23-No0001801	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S23-Oc0068272	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	R23-Oc0053223	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Heptachlor	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	R23-Oc0053223	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	R23-Oc0053223	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S23-Oc0074701	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S23-Oc0074701	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S23-Oc0074701	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S23-Oc0074701	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	R23-Oc0053223	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	R23-Oc0053223	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	R23-Oc0053223	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	R23-Oc0053223	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	R23-Oc0053223	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	R23-Oc0053223	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	R23-Oc0053223	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	R23-Oc0053223	NCP	mg/kg	< 10	< 10	<1	30%	Pass	

Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	R23-Oc0053223	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	R23-Oc0053223	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Nitrophenol	R23-Oc0053223	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	R23-Oc0053223	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	R23-Oc0053223	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	R23-Oc0053223	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	R23-Oc0053223	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	R23-Oc0053223	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	R23-Oc0053223	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	R23-Oc0053223	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S23-No0007365	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S23-No0007365	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S23-No0007365	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	B23-Oc0074797	CP	%	1.9	1.9	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Chromium	B23-Oc0074803	CP	mg/kg	250	190	27	30%	Pass	
Nickel	B23-Oc0074803	CP	mg/kg	210	170	24	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B23-Oc0074805	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	B23-Oc0074805	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	B23-Oc0074805	CP	mg/kg	49	44	11	30%	Pass	
Copper	B23-Oc0074805	CP	mg/kg	8.5	8.1	4.6	30%	Pass	
Lead	B23-Oc0074805	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	B23-Oc0074805	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	B23-Oc0074805	CP	mg/kg	38	36	7.1	30%	Pass	
Zinc	B23-Oc0074805	CP	mg/kg	29	28	4.8	30%	Pass	

Comments

Analysis of Crystalline Silica has been completed by AGON SA, report reference JL4847-15.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Zoe Flynn	Analytical Services Manager
Jonathon Angell	Senior Analyst-Volatile
Mickael Ros	Senior Analyst-Metal
Raymond Siu	Senior Analyst-Volatile
Roopesh Rangarajan	Senior Analyst-Organic



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E: samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
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☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	Douglas Partners Pty Ltd	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g.: Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE:	Brisbane	**ALS QUOTE NO.:**	EN-222-18
PROJECT:	200446.02	**COC SEQUENCE NUMBER (Circle)**	COC: 1 2 3 4 5 6 7 / 2 3 4 5 6 7
ORDER NUMBER:			
PROJECT MANAGER:	Dawit Bekele	**CONTACT PH:**	0499 269 560
SAMPLER:	Luk Baxter	**SAMPLER MOBILE:**	
COC emailed to ALS? (YES / NO)		**EDD FORMAT (or default):**	
Email Reports to	dawit.bekele@douglaspartners.com.au		
Email Invoice to	apinvoices@douglaspartners.com.au		

RELINQUISHED BY:	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:**
Dawit Bekele / Eurofins			
DATE/TIME:	**DATE/TIME:**	**DATE/TIME:**	**DATE/TIME:**

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	**SAMPLE DETAILS** MATRIX: Solid(S) Water(W)			**CONTAINER INFORMATION**		**ANALYSIS REQUIRED including SUITES** (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								**Additional Information**
						e-S8								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
LAB ID	**SAMPLE ID**	**DATE / TIME**	**MATRIX**	**TYPE & PRESERVATIVE** *(refer to codes below)*	**TOTAL BOTTLES**									
	S3	22/10/2023	S		1	X								
				TOTAL	1	1	0	0	0	0	0	0	0	

Environmental Division
Brisbane
Work Order Reference
EB2334180

Telephone : +61-7-3243 7222

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order	: **EB2334180**	Page	: 1 of 6
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: DAWIT BEKELE	Contact	: John Pickering
Address	: 439 MONTAGUE ROAD WEST END QLD, AUSTRALIA 4101	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61 7 3552 8634
Project	: 200446.02 CopperString 2.0 Project - Cloncurry	Date Samples Received	: 01-Nov-2023 16:35
Order number	: ----	Date Analysis Commenced	: 13-Nov-2023
C-O-C number	: ----	Issue Date	: 17-Nov-2023 15:28
Sampler	: LUKE BAXTER		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Soil Preparation, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EG005T (Total Metals by ICP-AES): EB2334496-001 shows poor matrix spike recovery due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): EB2335277-001 shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	S3	----	----	----	----
			Sampling date / time	22-Oct-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2334180-001	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**3.4**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**36**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**7**	----	----	----	----
Lead	7439-92-1	5	mg/kg	<5	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**30**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**15**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	S3	----	----	----	----
				Sampling date / time	22-Oct-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2334180-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**107**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**102**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**67.2**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**93.8**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**102**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**126**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**91.3**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**87.7**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	S3	----	----	----	----
				Sampling date / time	22-Oct-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2334180-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		**87.3**	**----**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	35	154
2-Chlorophenol-D4	93951-73-6	42	153
2.4.6-Tribromophenol	118-79-6	26	157
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	34	156
Anthracene-d10	1719-06-8	37	153
4-Terphenyl-d14	1718-51-0	42	172
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	53	134
Toluene-D8	2037-26-5	60	131
4-Bromofluorobenzene	460-00-4	59	127

QUALITY CONTROL REPORT

Work Order	: **EB2334180**	Page	: 1 of 7
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: DAWIT BEKELE	Contact	: John Pickering
Address	: 439 MONTAGUE ROAD WEST END QLD, AUSTRALIA 4101	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61 7 3552 8634
Project	: 200446.02 CopperString 2.0 Project - Cloncurry	Date Samples Received	: 01-Nov-2023
Order number	: ----	Date Analysis Commenced	: 13-Nov-2023
C-O-C number	: ----	Issue Date	: 17-Nov-2023
Sampler	: LUKE BAXTER		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Soil Preparation, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5419847)									
EB2335277-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<2	<2	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<5	<5	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<5	<5	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	16	7	74.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	16	8	69.7	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	809	# 69	169	0% - 20%
EB2334180-001	S3	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	36	34	3.6	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	30	28	5.0	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	7	8	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	15	14	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5419304)									
EB2334180-001	S3	EA055: Moisture Content	----	0.1	%	3.4	3.4	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5419848)									
EB2335280-003	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EB2334180-001	S3	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5419849)									
EB2334180-001	S3	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5419849) - continued									
EB2334180-001	S3	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5419303)									
EB2334180-001	S3	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5419850)									
EB2334180-001	S3	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EB2335280-003	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5419303)									
EB2334180-001	S3	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5419850)									
EB2334180-001	S3	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EB2335280-003	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 5419303)									
EB2334180-001	S3	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080: BTEXN (QC Lot: 5419303) - continued									
EB2334180-001	S3	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5419847)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	62.7 mg/kg	94.7	84.0	123
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
EG005T: Chromium	7440-47-3	2	mg/kg	<2	13.9 mg/kg	95.0	83.0	125
EG005T: Copper	7440-50-8	5	mg/kg	<5	37.2 mg/kg	101	86.0	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	44.9 mg/kg	100	84.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	12.07 mg/kg	96.2	81.5	118
EG005T: Zinc	7440-66-6	5	mg/kg	<5	140.7 mg/kg	98.4	80.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5419848)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.09199 mg/kg	107	70.0	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5419849)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	1.5 mg/kg	107	72.6	133
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	1.5 mg/kg	115	63.2	144
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	1.5 mg/kg	104	66.0	132
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	1.5 mg/kg	100	76.2	134
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	1.5 mg/kg	106	71.8	137
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	1.5 mg/kg	114	77.1	143
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	1.5 mg/kg	110	74.1	140
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	1.5 mg/kg	113	72.0	139
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	1.5 mg/kg	103	58.0	145
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	1.5 mg/kg	107	63.0	147
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	1.5 mg/kg	98.1	70.5	142
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	1.5 mg/kg	108	75.5	138
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	1.5 mg/kg	99.3	68.5	140
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	1.5 mg/kg	124	58.4	143
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	1.5 mg/kg	104	52.1	149
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	1.5 mg/kg	127	64.6	140
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5419303)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	18 mg/kg	105	64.0	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5419850)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	378 mg/kg	93.4	79.4	125

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5419850) - continued								
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	407 mg/kg	95.2	78.8	122
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5419303)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	22.5 mg/kg	115	58.1	124
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5419850)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	502 mg/kg	92.6	81.0	132
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	268 mg/kg	99.6	67.2	130
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
EP080: BTEXN (QCLot: 5419303)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	92.4	68.0	107
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	93.5	69.0	108
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	87.9	68.0	109
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	105	70.0	114
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	96.6	74.0	116
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	87.5	74.0	109

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5419847)							
EB2334496-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	73.7	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	88.4	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	108	70.0	130
		EG005T: Copper	7440-50-8	250 mg/kg	97.8	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	80.3	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	# 131	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	79.4	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5419848)							
EB2334496-001	Anonymous	EG035T: Mercury	7439-97-6	0.5 mg/kg	75.4	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5419849)							
EB2335253-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	1.5 mg/kg	104	66.0	132

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5419849) - continued							
EB2335253-001	Anonymous	EP075(SIM): Pyrene	129-00-0	1.5 mg/kg	108	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5419303)							
EB2334496-001	Anonymous	EP080: C6 - C9 Fraction	----	8 mg/kg	95.4	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5419850)							
EB2334496-001	Anonymous	EP071: C10 - C14 Fraction	----	379 mg/kg	98.3	70.0	130
		EP071: C15 - C28 Fraction	----	407 mg/kg	99.0	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5419303)							
EB2334496-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	8 mg/kg	98.1	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5419850)							
EB2334496-001	Anonymous	EP071: >C10 - C16 Fraction	----	502 mg/kg	98.2	70.0	130
		EP071: >C16 - C34 Fraction	----	268 mg/kg	103	70.0	130
EP080: BTEXN (QCLot: 5419303)							
EB2334496-001	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	99.6	70.0	130
		EP080: Toluene	108-88-3	2 mg/kg	98.0	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2334180**	Page	: 1 of 5
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: DAWIT BEKELE	Telephone	: +61 7 3552 8634
Project	: 200446.02 CopperString 2.0 Project - Cloncurry	Date Samples Received	: 01-Nov-2023
Site	: ----	Issue Date	: 17-Nov-2023
Sampler	: LUKE BAXTER	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005(ED093)T: Total Metals by ICP-AES	EB2335277--001	Anonymous	**Zinc**	7440-66-6	169 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EG005(ED093)T: Total Metals by ICP-AES	EB2334496--001	Anonymous	**Nickel**	7440-02-0	131 %	70.0-130%	**Recovery greater than upper data quality objective**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA055: Moisture Content (Dried @ 105-110°C)						
Soil miscellaneous glass jar						
S3	----	----	----	13-Nov-2023	05-Nov-2023	**8**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
Soil miscellaneous glass jar						
S3	13-Nov-2023	05-Nov-2023	**8**	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
Soil miscellaneous glass jar						
S3	13-Nov-2023	05-Nov-2023	**8**	13-Nov-2023	05-Nov-2023	**8**
Soil miscellaneous glass jar						
S3	13-Nov-2023	05-Nov-2023	**8**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions						
Soil miscellaneous glass jar						
S3	13-Nov-2023	05-Nov-2023	**8**	13-Nov-2023	05-Nov-2023	**8**
Soil miscellaneous glass jar						
S3	13-Nov-2023	05-Nov-2023	**8**	----	----	----
EP080: BTEXN						
Soil miscellaneous glass jar						
S3	13-Nov-2023	05-Nov-2023	**8**	13-Nov-2023	05-Nov-2023	**8**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil miscellaneous glass jar (EA055)							
S3	**22-Oct-2023**	**----**	----	----	**13-Nov-2023**	05-Nov-2023	×
EG005(ED093)T: Total Metals by ICP-AES							
Soil miscellaneous glass jar (EG005T)							
S3	**22-Oct-2023**	**14-Nov-2023**	19-Apr-2024	✓	**14-Nov-2023**	19-Apr-2024	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil miscellaneous glass jar (EG035T)							
S3	**22-Oct-2023**	**14-Nov-2023**	19-Nov-2023	✓	**15-Nov-2023**	19-Nov-2023	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil miscellaneous glass jar (EP075(SIM))							
S3	**22-Oct-2023**	**13-Nov-2023**	05-Nov-2023	×	**15-Nov-2023**	23-Dec-2023	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil miscellaneous glass jar (EP071)							
S3	**22-Oct-2023**	**13-Nov-2023**	05-Nov-2023	×	**15-Nov-2023**	23-Dec-2023	✓
Soil miscellaneous glass jar (EP080)							
S3	**22-Oct-2023**	**13-Nov-2023**	05-Nov-2023	×	**13-Nov-2023**	05-Nov-2023	×
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil miscellaneous glass jar (EP071)							
S3	**22-Oct-2023**	**13-Nov-2023**	05-Nov-2023	×	**15-Nov-2023**	23-Dec-2023	✓
Soil miscellaneous glass jar (EP080)							
S3	**22-Oct-2023**	**13-Nov-2023**	05-Nov-2023	×	**13-Nov-2023**	05-Nov-2023	×
EP080: BTEXN							
Soil miscellaneous glass jar (EP080)							
S3	**22-Oct-2023**	**13-Nov-2023**	05-Nov-2023	×	**13-Nov-2023**	05-Nov-2023	×

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

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02 9900 8400 EnviroSampleNSW@eurofins.com

☑ Brisbane Laboratory
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08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Hughenden	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele			Sampler(s)	Luke Baxter
Phone №	0499 289 560			Handed over by	Luke Baxter
Special Directions				Email for Invoice	apinvoices@douglaspartners.com.au
Purchase Order				Email for Results	Dawit.Bekele@douglaspartners.com.au
Quote ID №					

Analyses (Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing)

Containers (Change container type & size if necessary.)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked.)

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a-B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	Hug1-BH1/ 0.0 - 0.2	19/10/23	S	X												
2	Hug1-BH1/ 0.3 - 0.5	19/10/23	S													
3	Hug1-BH1/ / 0.8 - 1.0	19/10/23	S													
4	Hug1-BH1/ 1.3 - 1.5	19/10/23	S													
5	Hug1-BH2/ 0.0 - 0.2	19/10/23	S													
6	Hug1-BH2/ 0.3 - 0.5	19/10/23	S	X												
7	Hug1-BH2/ 0.8 - 1.0	19/10/23	S													
8	Hug1-BH2/ 1.3 - 1.5	19/10/23	S													
9																
10																
	Total Counts			2												

Date/Time: 27/10/23 10:30

Chilled: (Yes) No

Temp: 4.7

Correction: Final Temp:

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Name		Signature		Date		Time	
Eurofins | mgt Laboratory Use Only	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature	
	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №	

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Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

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03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd
Address	439 Montague Road, West End Qld 4101
Contact Name	Dawit Bekele
Phone №	0499 289 560
Special Directions	
Purchase Order	
Quote ID №	

Project №	200446.02
Project Name	CopperString 2.0 Project - Hughenden
Project Manager	Dawit Bekele
* EDD Format (ESdat, EQuIS etc)	Esdat

Sampler(s)	Luke Baxter
Handed over by	Luke Baxter
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	Hug2-BH2/ 0.0- 0.2	17/10/23	S	✖												
2	Hug2-BH2/ 0.3 -0.5	17/10/23	S													
3	Hug2-BH2/ /0.8 -1.0	17/10/23	S													
4	Hug2-BH2/ 1.3 - 1.5	17/10/23	S													
5	Hug2-BH3/ 0.0 - 0.2	17/10/23	S													
6	Hug2-BH3/ 0.3 - 0.5	17/10/23	S	✖												
7	Hug2-BH3 /0.8 - 1.0	17/10/23	S													
8	Hug2-BH3/ 1.3 - 1.5	17/10/23	S													
9																
10																
		Total Counts		2												

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal Name Signature Date Time

Eurofins | mgt Laboratory Use Only						
Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature	
Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №	

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CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

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Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☑ **Brisbane Laboratory**
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd
Address	439 Montague Road, West End Qld 4101
Contact Name	Dawit Bekele
Phone №	0499 289 560
Special Directions	
Purchase Order	
Quote ID №	

Project №	200446.02
Project Name	CopperString 2.0 Project - Hughenden
Project Manager	Dawit Bekele
EDD Format (ESdat, EQuIS etc)	Esdat

Sampler(s)	Luke Baxter
Handed over by	Luke Baxter
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	Hug1-BH3/ 0.0 - 0.2	18/10/23	S	✖												
2	Hug1-BH3/ 0.3 - 0.5	18/10/23	S													
3	Hug1-BH3/ / 0.8 - 1.0	18/10/23	S													
4	Hug1-BH3/ 1.3 - 1.5	18/10/23	S													
5	Hug2-BH1/ 0.0 - 0.2	17/10/23	S	✖												
6	Hug2-BH1/ 0.3 - 0.5	17/10/23	S													
7	Hug2-BH1/ 0.8 - 1.0	17/10/23	S													
8	Hug2-BH1/ 1.3 - 1.5	17/10/23	S													
9																
10																
		Total Counts		2												

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal Name Signature Date Time

Eurofins | mgt Laboratory Use Only						
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Time
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature
						Report №

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07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Hughenden	EDD Format ESdat, EQuIS etc	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter	
Handed over by	Luke Baxter	
Email for Invoice	apinvoices@douglaspartners.com.au	
Email for Results	Dawit.Bekele@douglaspartners.com.au	

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	Hug2-BH4/ 0.0- 0.2	17/10/23	S	X												
2	Hug2-BH4/ 0.3 - 0.5	17/10/23	S													
3	Hug2-BH4 / 0.8 - 1.0	17/10/23	S													
4	Hug2-BH4/ 1.3 - 1.5	17/10/23	S													
5	Hug2-BH5/ 0.0 - 0.2	18/10/23	S	X		X										
6	Hug2-BH5/ 0.3 - 0.5	18/10/23	S													
7	Hug2-BH5/1.0 - 1.2	18/10/23	S													
8	Hug2-BH5/ 1.3 - 1.4	18/10/23	S													
9																
10																
			Total Counts	2		1										

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal Name Signature Date Time

Eurofins | mgt Laboratory Use Only							
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Temperature
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Report №

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☐ **Perth Laboratory**
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08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Hughenden	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele			Sampler(s)	Luke Baxter
Phone №	0499 289 560			Handed over by	Luke Baxter
Special Directions				Email for Invoice	apinvoices@douglaspartners.com.au
Purchase Order				Email for Results	Dawit.Bekele@douglaspartners.com.au
Quote ID №					

Analyses
Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers
Change container type & size if necessary.

Required Turnaround Time (TAT)
Default will be 5 days if not ticked.

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	250mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	Hug2-BH6/ 0.0 -0.1	17/10/23	S	✖												
2	Hug2-BH6/ 0.4 - 0.6	17/10/23	S													
3	Hug2-BH6/ 0.8 -1.0	17/10/23	S													
4	Hug2-BH6/ 1.5-1.7	17/10/23	S													
5	Hug2-BH7/ 0.0 - 0.2	18/10/23	S													
6	Hug2-BH7/ 0.3 - 0.5	18/10/23	S	✖												
7	Hug2-BH7/ 1.0-1.2	18/10/23	S													
8	Hug2-BH7/ 1.5 -1.70	18/10/23	S													
9																
10																
		Total Counts		2												

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Name		Signature		Date		Time		Time	
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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Unit 2 91 Leach Highway Kewdale WA 6105
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☐ Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Hughenden	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter	
Handed over by	Luke Baxter	
Email for Invoice	apinvoices@douglaspartners.com.au	
Email for Results	Dawit.Bekele@douglaspartners.com.au	

Analyses
Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN
1	Hug2-BH8/ 0.0 -0.1	18/10/23	S	✖			
2	Hug2-BH8/ 0.4 - 0.6	18/10/23	S				
3	Hug2-BH8/ 0.8 -1.0	18/10/23	S				
4	Hug2-BH8/ 1.3 - 1.5	18/10/23	S				
5	Hug2-BH9/ 0.0 - 0.2	18/10/23	S				
6	Hug2-BH9/ 0.3 - 0.5	18/10/23	S	✖			
7	Hug2-BH9/ 0.8 - 1.0	18/10/23	S				
8	Hug2-BH9/ 1.3 - 1.5	18/10/23	S				
9							
10							
		Total Counts		2			

Containers
Change container type & size if necessary.

500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning

Required Turnaround Time (TAT)
Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal Name Signature Date Time

Eurofins | mgt Laboratory Use Only							
	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature	
	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №	

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CHAIN OF CUSTODY RECORD

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07 3902 4600 EnviroSampleQLD@eurofins.com

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08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Hughenden	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter
Handed over by	Luke Baxter
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses — Where metals are requested, please specify 'Total' or 'Filtered'. SUITE code must be used to attract SUITE pricing.

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 537.0a	TRH C6-C10/BTEXN
1	Hug2-BH10/ 0.0 -0.1	18/10/23	S				
2	Hug2-BH10/ 0.4 - 0.6	18/10/23	S				
3	Hug2-BH10/ 0.8 -1.0	18/10/23	S				
4	Hug2-BH10/ 1.3 - 1.8	18/10/23	S				
5	Hug2-BH11/ 0.0 - 0.2	18/10/23	S				
6	Hug2-BH11/ 0.3 - 0.5	18/10/23	S				
7	Hug2-BH11/ 0.8 - 1.0	18/10/23	S				
8	Hug2-BH11/ 1.3 - 1.5	18/10/23	S				
9							
10							
	Total Counts						

Containers — Change container type & size if necessary.

№	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Name | Signature | Date | Time

Eurofins | mgt Laboratory Use Only

Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Temperature
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Report №

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08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Hughenden	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter
Handed over by	Luke Baxter
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

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☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	Hug2-BH12/ 0.0 - 0.2	18/10/23	S	X		X										
2	Hug2-BH12/ 0.3 - 0.5	18/10/23	S													
3	Hug2-BH12/ 0.8 - 1.0	18/10/23	S													
4	Hug2-BH12/ 1.3 - 1.5	18/10/23	S													
5	R2	17/10/23	S													
6	S2	17/10/23	S													
7	R3	18/10/23	S													
8	S3	18/10/23	S													
9	Trip blank						X									
10	Trip Spike						X									
	Total Counts			1		1	2									

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal — Name — Signature — Date — Time

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	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №

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eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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ABN: 91 05 0159 898

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46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Christchurch	Tauranga
35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
West End
QLD 4101

Order No.:
Report #: 1039590
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Oct 27, 2023 10:30 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 2.0 PROJECT - HUGHENDEN
Project ID: 20446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
External Laboratory						X							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	Hug1-BH1/0-0.2	Oct 19, 2023		Soil	B23-Oc0072311			X		X	X		
2	Hug1-BH2/0.3-0.5	Oct 19, 2023		Soil	B23-Oc0072312			X		X	X		
3	Hug2-BH2/0-0.2	Oct 17, 2023		Soil	B23-Oc0072313			X		X	X		
4	Hug2-BH3/0.3-0.5	Oct 17, 2023		Soil	B23-Oc0072314			X		X	X		
5	Hug1-BH3/0-0.2	Oct 17, 2023		Soil	B23-Oc0072315			X		X	X		
6	Hug2-BH1/0-0.2	Oct 17, 2023		Soil	B23-Oc0072316			X		X	X		
7	Hug2-BH4/0-	Oct 17, 2023		Soil	B23-Oc0072317			X		X	X		

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Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
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VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
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Order No.:
Report #: 1039590
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Oct 27, 2023 10:30 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 2.0 PROJECT - HUGHENDEN
Project ID: 20446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
	0.2												
8	Hug2-BH5/0-0.2	Oct 18, 2023		Soil	B23-Oc0072318	X		X		X	X		
9	Hug2-BH6/0-0.2	Oct 17, 2023		Soil	B23-Oc0072319			X		X	X		
10	Hug2-BH7/0.3-0.5	Oct 18, 2023		Soil	B23-Oc0072320			X		X	X		
11	Hug2-BH8/0-0.2	Oct 18, 2023		Soil	B23-Oc0072321			X		X	X		
12	Hug2-BH9/0.3-0.5	Oct 18, 2023		Soil	B23-Oc0072322			X		X	X		
13	Hug2-BH12/0-0.2	Oct 18, 2023		Soil	B23-Oc0072323	X		X		X	X		
14	TRIP BLANK	Oct 18, 2023		Soil	B23-Oc0072324				X			X	
15	TRIP SPIKE	Oct 18, 2023		Soil	B23-Oc0072325				X				X
16	Hug1-BH1/0.3-	Oct 19, 2023		Soil	B23-Oc0072326		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Received: Oct 27, 2023 10:30 AM
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Contact Name: Dawit Bekele

Project Name: COPPERSTRING 2.0 PROJECT - HUGHENDEN
Project ID: 20446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
16	Hug1-BH1/0.3-0.5	Oct 19, 2023		Soil	B23-Oc0072326								
17	Hug1-BH1/0.8-1	Oct 19, 2023		Soil	B23-Oc0072327		X						
18	Hug1-BH1/1.3-1.5	Oct 19, 2023		Soil	B23-Oc0072328		X						
19	Hug1-BH2/0-0.2	Oct 19, 2023		Soil	B23-Oc0072329		X						
20	Hug1-BH2/0.8-1	Oct 19, 2023		Soil	B23-Oc0072330		X						
21	Hug1-BH2/1.3-1.5	Oct 19, 2023		Soil	B23-Oc0072331		X						
22	Hug2-BH2/0.3-0.5	Oct 17, 2023		Soil	B23-Oc0072332		X						
23	Hug2-BH2/0.8-1	Oct 17, 2023		Soil	B23-Oc0072333		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Project ID: 20446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
24	Hug2-BH2/1.3-1.5	Oct 17, 2023		Soil	B23-Oc0072334		X						
25	Hug2-BH3/0-0.2	Oct 17, 2023		Soil	B23-Oc0072335		X						
26	Hug2-BH3/0.8-1	Oct 17, 2023		Soil	B23-Oc0072336		X						
27	Hug2-BH3/1.3-1.5	Oct 17, 2023		Soil	B23-Oc0072337		X						
28	Hug1-BH3/0.3-0.5	Oct 17, 2023		Soil	B23-Oc0072338		X						
29	Hug1-BH3/0.8-1	Oct 17, 2023		Soil	B23-Oc0072339		X						
30	Hug1-BH3/1.3-1.5	Oct 17, 2023		Soil	B23-Oc0072340		X						
31	Hug2-BH1/0.3-0.5	Oct 17, 2023		Soil	B23-Oc0072341		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Project ID: 20446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
32	Hug2-BH1/0.8-1	Oct 17, 2023		Soil	B23-Oc0072342		X						
33	Hug2-BH1/1.3-1.5	Oct 17, 2023		Soil	B23-Oc0072343		X						
34	Hug2-BH4/0.3-0.5	Oct 17, 2023		Soil	B23-Oc0072344		X						
35	Hug2-BH4/0.8-1	Oct 17, 2023		Soil	B23-Oc0072345		X						
36	Hug2-BH4/1.3-1.5	Oct 17, 2023		Soil	B23-Oc0072346		X						
37	Hug2-BH5/0.3-0.5	Oct 18, 2023		Soil	B23-Oc0072347		X						
38	Hug2-BH5/0.8-1	Oct 18, 2023		Soil	B23-Oc0072348		X						
39	Hug2-BH5/1.3-1.5	Oct 18, 2023		Soil	B23-Oc0072349		X						

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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Project ID: 20446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
40	Hug2-BH6/0.3-0.5	Oct 17, 2023		Soil	B23-Oc0072350		X						
41	Hug2-BH6/0.8-1	Oct 17, 2023		Soil	B23-Oc0072351		X						
42	Hug2-BH6/1.3-1.5	Oct 17, 2023		Soil	B23-Oc0072352		X						
43	Hug2-BH7/0-0.2	Oct 18, 2023		Soil	B23-Oc0072353		X						
44	Hug2-BH7/0.8-1	Oct 18, 2023		Soil	B23-Oc0072354		X						
45	Hug2-BH7/1.3-1.5	Oct 18, 2023		Soil	B23-Oc0072355		X						
46	Hug2-BH8/0.3-0.5	Oct 18, 2023		Soil	B23-Oc0072356		X						
47	Hug2-BH8/0.8-1	Oct 18, 2023		Soil	B23-Oc0072357		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
48	Hug2-BH8/1.3-1.5	Oct 18, 2023		Soil	B23-Oc0072358		X						
49	Hug2-BH9/0-0.2	Oct 18, 2023		Soil	B23-Oc0072359		X						
50	Hug2-BH9/0.8-1	Oct 18, 2023		Soil	B23-Oc0072360		X						
51	Hug2-BH9/1.3-1.5	Oct 18, 2023		Soil	B23-Oc0072361		X						
52	Hug2-BH10/0-0.2	Oct 18, 2023		Soil	B23-Oc0072362		X						
53	Hug2-BH10/0.3-0.5	Oct 18, 2023		Soil	B23-Oc0072363		X						
54	Hug2-BH10/0.8-1	Oct 18, 2023		Soil	B23-Oc0072364		X						
55	Hug2-BH10/1.3-1.5	Oct 18, 2023		Soil	B23-Oc0072365		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
56	Hug2-BH11/0-0.2	Oct 18, 2023		Soil	B23-Oc0072366		X						
57	Hug2-BH11/0.3-0.5	Oct 18, 2023		Soil	B23-Oc0072367		X						
58	Hug2-BH11/0.8-1	Oct 18, 2023		Soil	B23-Oc0072368		X						
59	Hug2-BH11/1.3-1.5	Oct 18, 2023		Soil	B23-Oc0072369		X						
60	Hug2-BH12/0.3-0.5	Oct 18, 2023		Soil	B23-Oc0072370		X						
61	Hug2-BH12/0.8-1	Oct 18, 2023		Soil	B23-Oc0072371		X						
62	Hug2-BH12/1.3-1.5	Oct 18, 2023		Soil	B23-Oc0072372		X						
63	R2	Oct 18, 2023		Soil	B23-Oc0072373		X						
64	S2	Oct 18, 2023		Soil	B23-Oc0072374		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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IANZ# 1327	IANZ# 1290	IANZ# 1402

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Order No.:
Report #: 1039590
Phone: 07 3237 8900
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Received: Oct 27, 2023 10:30 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 2.0 PROJECT - HUGHENDEN
Project ID: 20446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
65	R3	Oct 18, 2023		Soil	B23-Oc0072375		X						
66	S3	Oct 18, 2023		Soil	B23-Oc0072376		X						
Test Counts						2	51	13	15	15	13	1	1

Douglas Partners Pty Ltd
439 Montague Road
West End
QLD 4101

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Dawit Bekele**

Report **1039590-S**
Project name COPPERSTRING 2.0 PROJECT - HUGHENDEN
Project ID 20446.02
Received Date Oct 27, 2023

Client Sample ID			**Hug1-BH1/0-0.2**	**Hug1-BH2/0.3-0.5**	**Hug2-BH2/0-0.2**	**Hug2-BH3/0.3-0.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0072311**	**B23-Oc0072312**	**B23-Oc0072313**	**B23-Oc0072314**
Date Sampled			**Oct 19, 2023**	**Oct 19, 2023**	**Oct 17, 2023**	**Oct 17, 2023**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	96	96	100	101
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			Hug1-BH1/0-0.2	Hug1-BH2/0.3-0.5	Hug2-BH2/0-0.2	Hug2-BH3/0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0072311	B23-Oc0072312	B23-Oc0072313	B23-Oc0072314
Date Sampled			Oct 19, 2023	Oct 19, 2023	Oct 17, 2023	Oct 17, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	111	106	108	110
p-Terphenyl-d14 (surr.)	1	%	129	126	129	130
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	94	87	127	130
Tetrachloro-m-xylene (surr.)	1	%	84	78	103	102
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			Hug1-BH1/0-0.2	Hug1-BH2/0.3-0.5	Hug2-BH2/0-0.2	Hug2-BH3/0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0072311	B23-Oc0072312	B23-Oc0072313	B23-Oc0072314
Date Sampled			Oct 19, 2023	Oct 19, 2023	Oct 17, 2023	Oct 17, 2023
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	110	108	149	140
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	94	87	127	130
Tetrachloro-m-xylene (surr.)	1	%	84	78	103	102
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1

Client Sample ID			Hug1-BH1/0-0.2	Hug1-BH2/0.3-0.5	Hug2-BH2/0-0.2	Hug2-BH3/0.3-0.5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0072311**	**B23-Oc0072312**	**B23-Oc0072313**	**B23-Oc0072314**
Date Sampled			**Oct 19, 2023**	**Oct 19, 2023**	**Oct 17, 2023**	**Oct 17, 2023**
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Nitrophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	106	101	116	100
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	20	14	11	5.6
Cadmium	0.5	mg/kg	7.4	6.0	2.3	< 0.5
Chromium	5	mg/kg	96	68	45	29
Copper	5	mg/kg	110	68	37	20
Lead	5	mg/kg	14	13	18	12
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	81	57	29	24
Zinc	5	mg/kg	310	200	98	89
Sample Properties						
% Moisture	1	%	33	32	4.4	16

Client Sample ID			Hug1-BH3/0-0.2	Hug2-BH1/0-0.2	Hug2-BH4/0-0.2	Hug2-BH5/0-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0072315**	**B23-Oc0072316**	**B23-Oc0072317**	**B23-Oc0072318**
Date Sampled			**Oct 17, 2023**	**Oct 17, 2023**	**Oct 17, 2023**	**Oct 18, 2023**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			Hug1-BH3/0-0.2	Hug2-BH1/0-0.2	Hug2-BH4/0-0.2	Hug2-BH5/0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0072315	B23-Oc0072316	B23-Oc0072317	B23-Oc0072318
Date Sampled			Oct 17, 2023	Oct 17, 2023	Oct 17, 2023	Oct 18, 2023
Test/Reference	LOR	Unit				
BTEX						
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	100	105	104	96
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	110	109	109	111
p-Terphenyl-d14 (surr.)	1	%	126	129	128	124
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			Hug1-BH3/0-0.2	Hug2-BH1/0-0.2	Hug2-BH4/0-0.2	Hug2-BH5/0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0072315	B23-Oc0072316	B23-Oc0072317	B23-Oc0072318
Date Sampled			Oct 17, 2023	Oct 17, 2023	Oct 17, 2023	Oct 18, 2023
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	76	130	122	106
Tetrachloro-m-xylene (surr.)	1	%	65	101	96	93
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	87	149	142	129

Client Sample ID			Hug1-BH3/0-0.2	Hug2-BH1/0-0.2	Hug2-BH4/0-0.2	Hug2-BH5/0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0072315	B23-Oc0072316	B23-Oc0072317	B23-Oc0072318
Date Sampled			Oct 17, 2023	Oct 17, 2023	Oct 17, 2023	Oct 18, 2023
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	76	130	122	106
Tetrachloro-m-xylene (surr.)	1	%	65	101	96	93
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Nitrophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	99	80	107	110
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	9.3	8.9	8.1	15
Cadmium	0.5	mg/kg	2.0	1.3	2.8	1.6
Chromium	5	mg/kg	46	47	38	44
Copper	5	mg/kg	42	36	36	41
Lead	5	mg/kg	15	18	11	16
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	34	35	30	44
Zinc	5	mg/kg	110	130	110	170

Client Sample ID			Hug1-BH3/0-0.2	Hug2-BH1/0-0.2	Hug2-BH4/0-0.2	Hug2-BH5/0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0072315	B23-Oc0072316	B23-Oc0072317	B23-Oc0072318
Date Sampled			Oct 17, 2023	Oct 17, 2023	Oct 17, 2023	Oct 18, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	16	13	10	40
Crystalline Silica			-	-	-	See Attached

Client Sample ID			Hug2-BH6/0-0.2	Hug2-BH7/0.3-0.5	Hug2-BH8/0-0.2	Hug2-BH9/0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0072319	B23-Oc0072320	B23-Oc0072321	B23-Oc0072322
Date Sampled			Oct 17, 2023	Oct 18, 2023	Oct 18, 2023	Oct 18, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	103	98	104	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			Hug2-BH6/0-0.2	Hug2-BH7/0.3-0.5	Hug2-BH8/0-0.2	Hug2-BH9/0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0072319	B23-Oc0072320	B23-Oc0072321	B23-Oc0072322
Date Sampled			Oct 17, 2023	Oct 18, 2023	Oct 18, 2023	Oct 18, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	110	109	113	116
p-Terphenyl-d14 (surr.)	1	%	127	125	132	125
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	124	92	94	99
Tetrachloro-m-xylene (surr.)	1	%	99	104	113	91
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			Hug2-BH6/0-0.2	Hug2-BH7/0.3-0.5	Hug2-BH8/0-0.2	Hug2-BH9/0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0072319	B23-Oc0072320	B23-Oc0072321	B23-Oc0072322
Date Sampled			Oct 17, 2023	Oct 18, 2023	Oct 18, 2023	Oct 18, 2023
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	139	111	118	122
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	124	92	94	99
Tetrachloro-m-xylene (surr.)	1	%	99	104	113	91
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Nitrophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5

Client Sample ID			Hug2-BH6/0-0.2	Hug2-BH7/0.3-0.5	Hug2-BH8/0-0.2	Hug2-BH9/0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0072319	B23-Oc0072320	B23-Oc0072321	B23-Oc0072322
Date Sampled			Oct 17, 2023	Oct 18, 2023	Oct 18, 2023	Oct 18, 2023
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	0.4
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.7
Phenol-d6 (surr.)	1	%	89	93	101	114
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	16	12	8.8	5.1
Cadmium	0.5	mg/kg	3.5	1.8	0.8	< 0.5
Chromium	5	mg/kg	50	47	42	30
Copper	5	mg/kg	49	38	33	22
Lead	5	mg/kg	11	13	18	14
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	56	42	40	25
Zinc	5	mg/kg	190	150	150	100
Sample Properties						
% Moisture	1	%	8.2	29	19	32

Client Sample ID			Hug2-BH12/0-0.2	TRIP BLANK	TRIP SPIKE
Sample Matrix			Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			B23-Oc0072323	B23-Oc0072324	B23-Oc0072325
Date Sampled			Oct 18, 2023	Oct 18, 2023	Oct 18, 2023
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	-
TRH C10-C14	20	mg/kg	< 20	-	-
TRH C15-C28	50	mg/kg	< 50	-	-
TRH C29-C36	50	mg/kg	< 50	-	-
TRH C10-C36 (Total)	50	mg/kg	< 50	-	-
BTEX					
Benzene	0.1	mg/kg	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	100	92	-

Client Sample ID			Hug2-BH12/0-0.2	TRIP BLANK	TRIP SPIKE
Sample Matrix			Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			B23-Oc0072323	B23-Oc0072324	B23-Oc0072325
Date Sampled			Oct 18, 2023	Oct 18, 2023	Oct 18, 2023
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	-
TRH C6-C10	20	mg/kg	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	-
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-
Acenaphthene	0.5	mg/kg	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	-
Anthracene	0.5	mg/kg	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-
Chrysene	0.5	mg/kg	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-
Fluoranthene	0.5	mg/kg	< 0.5	-	-
Fluorene	0.5	mg/kg	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-
Naphthalene	0.5	mg/kg	< 0.5	-	-
Phenanthrene	0.5	mg/kg	< 0.5	-	-
Pyrene	0.5	mg/kg	< 0.5	-	-
Total PAH*	0.5	mg/kg	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	111	-	-
p-Terphenyl-d14 (surr.)	1	%	127	-	-
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-
a-HCH	0.05	mg/kg	< 0.05	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-
b-HCH	0.05	mg/kg	< 0.05	-	-
d-HCH	0.05	mg/kg	< 0.05	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-
Endrin	0.05	mg/kg	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-
g-HCH (Lindane)	0.05	mg/kg	< 0.05	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-

Client Sample ID			Hug2-BH12/0-0.2	TRIP BLANK	TRIP SPIKE
Sample Matrix			Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			B23-Oc0072323	B23-Oc0072324	B23-Oc0072325
Date Sampled			Oct 18, 2023	Oct 18, 2023	Oct 18, 2023
Test/Reference	LOR	Unit			
Organochlorine Pesticides					
Methoxychlor	0.05	mg/kg	< 0.05	-	-
Toxaphene	0.5	mg/kg	< 0.5	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	99	-	-
Tetrachloro-m-xylene (surr.)	1	%	90	-	-
Organophosphorus Pesticides					
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-
Bolstar	0.2	mg/kg	< 0.2	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-
Coumaphos	2	mg/kg	< 2	-	-
Demeton-S	0.2	mg/kg	< 0.2	-	-
Demeton-O	0.2	mg/kg	< 0.2	-	-
Diazinon	0.2	mg/kg	< 0.2	-	-
Dichlorvos	0.2	mg/kg	< 0.2	-	-
Dimethoate	0.2	mg/kg	< 0.2	-	-
Disulfoton	0.2	mg/kg	< 0.2	-	-
EPN	0.2	mg/kg	< 0.2	-	-
Ethion	0.2	mg/kg	< 0.2	-	-
Ethoprop	0.2	mg/kg	< 0.2	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	-
Fenitrothion	0.2	mg/kg	< 0.2	-	-
Fensulfothion	0.2	mg/kg	< 0.2	-	-
Fenthion	0.2	mg/kg	< 0.2	-	-
Malathion	0.2	mg/kg	< 0.2	-	-
Merphos	0.2	mg/kg	< 0.2	-	-
Methyl parathion	0.2	mg/kg	< 0.2	-	-
Mevinphos	0.2	mg/kg	< 0.2	-	-
Monocrotophos	2	mg/kg	< 2	-	-
Naled	0.2	mg/kg	< 0.2	-	-
Omethoate	2	mg/kg	< 2	-	-
Phorate	0.2	mg/kg	< 0.2	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-
Pyrazophos	0.2	mg/kg	< 0.2	-	-
Ronnel	0.2	mg/kg	< 0.2	-	-
Terbufos	0.2	mg/kg	< 0.2	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-
Tokuthion	0.2	mg/kg	< 0.2	-	-
Trichloronate	0.2	mg/kg	< 0.2	-	-
Triphenylphosphate (surr.)	1	%	126	-	-

Client Sample ID			Hug2-BH12/0-0.2	TRIP BLANK	TRIP SPIKE
Sample Matrix			Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			B23-Oc0072323	B23-Oc0072324	B23-Oc0072325
Date Sampled			Oct 18, 2023	Oct 18, 2023	Oct 18, 2023
Test/Reference	LOR	Unit			
Polychlorinated Biphenyls					
Aroclor-1016	0.1	mg/kg	< 0.1	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	-
Total PCB*	0.1	mg/kg	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	99	-	-
Tetrachloro-m-xylene (surr.)	1	%	90	-	-
Phenols (Halogenated)					
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	-
Pentachlorophenol	1	mg/kg	< 1	-	-
Tetrachlorophenols - Total	10	mg/kg	< 10	-	-
Total Halogenated Phenol*	1	mg/kg	< 1	-	-
Phenols (non-Halogenated)					
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-
2-Nitrophenol	1.0	mg/kg	< 1	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-
2.4-Dinitrophenol	5	mg/kg	< 5	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-
Total cresols*	0.5	mg/kg	< 0.5	-	-
4-Nitrophenol	5	mg/kg	< 5	-	-
Dinoseb	20	mg/kg	< 20	-	-
Phenol	0.5	mg/kg	< 0.5	-	-
Phenol-d6 (surr.)	1	%	110	-	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16	50	mg/kg	< 50	-	-
TRH >C16-C34	100	mg/kg	< 100	-	-
TRH >C34-C40	100	mg/kg	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	-
Heavy Metals					
Arsenic	2	mg/kg	19	-	-
Cadmium	0.5	mg/kg	5.7	-	-
Chromium	5	mg/kg	79	-	-
Copper	5	mg/kg	80	-	-
Lead	5	mg/kg	16	-	-
Mercury	0.1	mg/kg	< 0.1	-	-
Nickel	5	mg/kg	71	-	-
Zinc	5	mg/kg	250	-	-

Client Sample ID			Hug2-BH12/0-0.2	TRIP BLANK	TRIP SPIKE
Sample Matrix			Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			B23-Oc0072323	B23-Oc0072324	B23-Oc0072325
Date Sampled			Oct 18, 2023	Oct 18, 2023	Oct 18, 2023
Test/Reference	LOR	Unit			
Sample Properties					
% Moisture	1	%	30	-	-
Crystalline Silica			See Attached	-	-
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-
Naphthalene	1	%	-	-	17
TRH C6-C10	1	%	-	-	22
TRH C6-C9	1	%	-	-	22
Total Recoverable Hydrocarbons					
TRH C6-C10	20	mg/kg	-	< 20	-
BTEX					
Benzene	1	%	-	-	12
Ethylbenzene	1	%	-	-	14
m&p-Xylenes	1	%	-	-	13
o-Xylene	1	%	-	-	14
Toluene	1	%	-	-	14
Xylenes - Total	1	%	-	-	13
4-Bromofluorobenzene (surr.)	1	%	-	-	98

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Brisbane	Nov 01, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Brisbane	Nov 01, 2023	14 Days
- Method: USEPA SW846 8260			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Brisbane	Nov 01, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Naphthalene	Brisbane	Nov 01, 2023	14 Days
- Method: USEPA 8260B - MGT 350A Volatile Organics by GCMS			
Total Recoverable Hydrocarbons	Brisbane	Nov 01, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Eurofins Suite B7A			
Polycyclic Aromatic Hydrocarbons	Brisbane	Nov 01, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Brisbane	Nov 01, 2023	14 Days
- Method: USEPA M 8270 (LTM-ORG-2130 PAH & Phenols in Soil & Water by GC-MS)			
Phenols (non-Halogenated)	Brisbane	Nov 01, 2023	14 Days
- Method: USEPA M 8270 (LTM-ORG-2130 PAH & Phenols in Soil & Water by GC-MS)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Brisbane	Nov 01, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Brisbane	Nov 01, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B15			
Organochlorine Pesticides	Sydney	Nov 02, 2023	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Nov 02, 2023	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Sydney	Nov 02, 2023	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
% Moisture	Sydney	Oct 31, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Crystalline Silica	Melbourne	Oct 31, 2023	10 Days
- Method:			

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Company Name: Douglas Partners (Qld) Pty Ltd
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West End
QLD 4101

Order No.:
Report #: 1039590
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Oct 27, 2023 10:30 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 2.0 PROJECT - HUGHENDEN
Project ID: 20446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
External Laboratory						X							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	Hug1-BH1/0-0.2	Oct 19, 2023		Soil	B23-Oc0072311			X		X	X		
2	Hug1-BH2/0.3-0.5	Oct 19, 2023		Soil	B23-Oc0072312			X		X	X		
3	Hug2-BH2/0-0.2	Oct 17, 2023		Soil	B23-Oc0072313			X		X	X		
4	Hug2-BH3/0.3-0.5	Oct 17, 2023		Soil	B23-Oc0072314			X		X	X		
5	Hug1-BH3/0-0.2	Oct 17, 2023		Soil	B23-Oc0072315			X		X	X		
6	Hug2-BH1/0-0.2	Oct 17, 2023		Soil	B23-Oc0072316			X		X	X		
7	Hug2-BH4/0-	Oct 17, 2023		Soil	B23-Oc0072317			X		X	X		

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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Eurofins Environment Testing NZ Ltd
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IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
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Order No.:
Report #: 1039590
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Oct 27, 2023 10:30 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 2.0 PROJECT - HUGHENDEN
Project ID: 20446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
	0.2												
8	Hug2-BH5/0-0.2	Oct 18, 2023		Soil	B23-Oc0072318	X		X		X	X		
9	Hug2-BH6/0-0.2	Oct 17, 2023		Soil	B23-Oc0072319			X		X	X		
10	Hug2-BH7/0.3-0.5	Oct 18, 2023		Soil	B23-Oc0072320			X		X	X		
11	Hug2-BH8/0-0.2	Oct 18, 2023		Soil	B23-Oc0072321			X		X	X		
12	Hug2-BH9/0.3-0.5	Oct 18, 2023		Soil	B23-Oc0072322			X		X	X		
13	Hug2-BH12/0-0.2	Oct 18, 2023		Soil	B23-Oc0072323	X		X		X	X		
14	TRIP BLANK	Oct 18, 2023		Soil	B23-Oc0072324				X			X	
15	TRIP SPIKE	Oct 18, 2023		Soil	B23-Oc0072325				X				X
16	Hug1-BH1/0.3-	Oct 19, 2023		Soil	B23-Oc0072326		X						

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6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
16	Hug1-BH1/0.3-0.5	Oct 19, 2023		Soil	B23-Oc0072326								
17	Hug1-BH1/0.8-1	Oct 19, 2023		Soil	B23-Oc0072327		X						
18	Hug1-BH1/1.3-1.5	Oct 19, 2023		Soil	B23-Oc0072328		X						
19	Hug1-BH2/0-0.2	Oct 19, 2023		Soil	B23-Oc0072329		X						
20	Hug1-BH2/0.8-1	Oct 19, 2023		Soil	B23-Oc0072330		X						
21	Hug1-BH2/1.3-1.5	Oct 19, 2023		Soil	B23-Oc0072331		X						
22	Hug2-BH2/0.3-0.5	Oct 17, 2023		Soil	B23-Oc0072332		X						
23	Hug2-BH2/0.8-1	Oct 17, 2023		Soil	B23-Oc0072333		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
24	Hug2-BH2/1.3-1.5	Oct 17, 2023		Soil	B23-Oc0072334		X						
25	Hug2-BH3/0-0.2	Oct 17, 2023		Soil	B23-Oc0072335		X						
26	Hug2-BH3/0.8-1	Oct 17, 2023		Soil	B23-Oc0072336		X						
27	Hug2-BH3/1.3-1.5	Oct 17, 2023		Soil	B23-Oc0072337		X						
28	Hug1-BH3/0.3-0.5	Oct 17, 2023		Soil	B23-Oc0072338		X						
29	Hug1-BH3/0.8-1	Oct 17, 2023		Soil	B23-Oc0072339		X						
30	Hug1-BH3/1.3-1.5	Oct 17, 2023		Soil	B23-Oc0072340		X						
31	Hug2-BH1/0.3-0.5	Oct 17, 2023		Soil	B23-Oc0072341		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
32	Hug2-BH1/0.8-1	Oct 17, 2023		Soil	B23-Oc0072342		X						
33	Hug2-BH1/1.3-1.5	Oct 17, 2023		Soil	B23-Oc0072343		X						
34	Hug2-BH4/0.3-0.5	Oct 17, 2023		Soil	B23-Oc0072344		X						
35	Hug2-BH4/0.8-1	Oct 17, 2023		Soil	B23-Oc0072345		X						
36	Hug2-BH4/1.3-1.5	Oct 17, 2023		Soil	B23-Oc0072346		X						
37	Hug2-BH5/0.3-0.5	Oct 18, 2023		Soil	B23-Oc0072347		X						
38	Hug2-BH5/0.8-1	Oct 18, 2023		Soil	B23-Oc0072348		X						
39	Hug2-BH5/1.3-1.5	Oct 18, 2023		Soil	B23-Oc0072349		X						

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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
40	Hug2-BH6/0.3-0.5	Oct 17, 2023		Soil	B23-Oc0072350		X						
41	Hug2-BH6/0.8-1	Oct 17, 2023		Soil	B23-Oc0072351		X						
42	Hug2-BH6/1.3-1.5	Oct 17, 2023		Soil	B23-Oc0072352		X						
43	Hug2-BH7/0-0.2	Oct 18, 2023		Soil	B23-Oc0072353		X						
44	Hug2-BH7/0.8-1	Oct 18, 2023		Soil	B23-Oc0072354		X						
45	Hug2-BH7/1.3-1.5	Oct 18, 2023		Soil	B23-Oc0072355		X						
46	Hug2-BH8/0.3-0.5	Oct 18, 2023		Soil	B23-Oc0072356		X						
47	Hug2-BH8/0.8-1	Oct 18, 2023		Soil	B23-Oc0072357		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
48	Hug2-BH8/1.3-1.5	Oct 18, 2023		Soil	B23-Oc0072358		X						
49	Hug2-BH9/0-0.2	Oct 18, 2023		Soil	B23-Oc0072359		X						
50	Hug2-BH9/0.8-1	Oct 18, 2023		Soil	B23-Oc0072360		X						
51	Hug2-BH9/1.3-1.5	Oct 18, 2023		Soil	B23-Oc0072361		X						
52	Hug2-BH10/0-0.2	Oct 18, 2023		Soil	B23-Oc0072362		X						
53	Hug2-BH10/0.3-0.5	Oct 18, 2023		Soil	B23-Oc0072363		X						
54	Hug2-BH10/0.8-1	Oct 18, 2023		Soil	B23-Oc0072364		X						
55	Hug2-BH10/1.3-1.5	Oct 18, 2023		Soil	B23-Oc0072365		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
56	Hug2-BH11/0-0.2	Oct 18, 2023		Soil	B23-Oc0072366		X						
57	Hug2-BH11/0.3-0.5	Oct 18, 2023		Soil	B23-Oc0072367		X						
58	Hug2-BH11/0.8-1	Oct 18, 2023		Soil	B23-Oc0072368		X						
59	Hug2-BH11/1.3-1.5	Oct 18, 2023		Soil	B23-Oc0072369		X						
60	Hug2-BH12/0.3-0.5	Oct 18, 2023		Soil	B23-Oc0072370		X						
61	Hug2-BH12/0.8-1	Oct 18, 2023		Soil	B23-Oc0072371		X						
62	Hug2-BH12/1.3-1.5	Oct 18, 2023		Soil	B23-Oc0072372		X						
63	R2	Oct 18, 2023		Soil	B23-Oc0072373		X						
64	S2	Oct 18, 2023		Soil	B23-Oc0072374		X						

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Melbourne Laboratory - NATA # 1261 Site # 1254													
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X
65	R3	Oct 18, 2023		Soil	B23-Oc0072375		X						
66	S3	Oct 18, 2023		Soil	B23-Oc0072376		X						
Test Counts						2	51	13	15	15	13	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30%; however the following acceptance guidelines are equally applicable: Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported, have been reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 10			10	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.5			0.5	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	105			70-130	Pass	
TRH C10-C14	%	107			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	106			70-130	Pass	
Toluene	%	104			70-130	Pass	
Ethylbenzene	%	105			70-130	Pass	
m&p-Xylenes	%	108			70-130	Pass	
Xylenes - Total*	%	108			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	%	103			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	91			70-130	Pass	
Acenaphthylene	%	100			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Anthracene	%	84			70-130	Pass	
Benz(a)anthracene	%	96			70-130	Pass	
Benzo(a)pyrene	%	81			70-130	Pass	
Benzo(b&j)fluoranthene	%	127			70-130	Pass	
Benzo(g.h.i)perylene	%	84			70-130	Pass	
Benzo(k)fluoranthene	%	70			70-130	Pass	
Chrysene	%	79			70-130	Pass	
Dibenz(a.h)anthracene	%	93			70-130	Pass	
Fluoranthene	%	96			70-130	Pass	
Fluorene	%	86			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	76			70-130	Pass	
Naphthalene	%	89			70-130	Pass	
Phenanthrene	%	76			70-130	Pass	
Pyrene	%	80			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	98			70-130	Pass	
4.4'-DDD	%	108			70-130	Pass	
4.4'-DDE	%	88			70-130	Pass	
4.4'-DDT	%	109			70-130	Pass	
a-HCH	%	89			70-130	Pass	
Aldrin	%	87			70-130	Pass	
b-HCH	%	78			70-130	Pass	
d-HCH	%	88			70-130	Pass	
Dieldrin	%	94			70-130	Pass	
Endosulfan I	%	94			70-130	Pass	
Endosulfan II	%	96			70-130	Pass	
Endosulfan sulphate	%	94			70-130	Pass	
Endrin	%	103			70-130	Pass	
Endrin aldehyde	%	95			70-130	Pass	
Endrin ketone	%	94			70-130	Pass	
g-HCH (Lindane)	%	77			70-130	Pass	
Heptachlor	%	95			70-130	Pass	
Heptachlor epoxide	%	98			70-130	Pass	
Hexachlorobenzene	%	88			70-130	Pass	
Methoxychlor	%	102			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	92			70-130	Pass	
Dimethoate	%	93			70-130	Pass	
Ethion	%	122			70-130	Pass	
Fenitrothion	%	87			70-130	Pass	
Methyl parathion	%	109			70-130	Pass	
Mevinphos	%	103			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1016	%	70			70-130	Pass	
Aroclor-1260	%	84			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	80			25-140	Pass	
2.4-Dichlorophenol	%	58			25-140	Pass	
2.4.5-Trichlorophenol	%	47			25-140	Pass	
2.4.6-Trichlorophenol	%	85			25-140	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.6-Dichlorophenol	%	87			25-140	Pass	
4-Chloro-3-methylphenol	%	80			25-140	Pass	
Pentachlorophenol	%	64			25-140	Pass	
Tetrachlorophenols - Total	%	65			25-140	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Nitrophenol	%	85			25-140	Pass	
2.4-Dimethylphenol	%	66			25-140	Pass	
2.4-Dinitrophenol	%	103			25-140	Pass	
2-Methylphenol (o-Cresol)	%	83			25-140	Pass	
3&4-Methylphenol (m&p-Cresol)	%	87			25-140	Pass	
4-Nitrophenol	%	86			25-140	Pass	
Dinoseb	%	112			25-140	Pass	
Phenol	%	98			25-140	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	106			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	91			80-120	Pass	
Cadmium	%	92			80-120	Pass	
Chromium	%	100			80-120	Pass	
Copper	%	100			80-120	Pass	
Lead	%	101			80-120	Pass	
Mercury	%	107			80-120	Pass	
Nickel	%	100			80-120	Pass	
Zinc	%	98			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	B23-No0001112	NCP	%	101			70-130	Pass	
Acenaphthylene	B23-Oc0057335	NCP	%	87			70-130	Pass	
Anthracene	B23-No0001112	NCP	%	94			70-130	Pass	
Benz(a)anthracene	B23-Oc0073605	NCP	%	103			70-130	Pass	
Benzo(a)pyrene	B23-No0001112	NCP	%	89			70-130	Pass	
Benzo(b&j)fluoranthene	B23-No0001112	NCP	%	100			70-130	Pass	
Benzo(g.h.i)perylene	B23-No0001112	NCP	%	86			70-130	Pass	
Benzo(k)fluoranthene	B23-Oc0073458	NCP	%	91			70-130	Pass	
Chrysene	B23-No0001112	NCP	%	83			70-130	Pass	
Dibenz(a.h)anthracene	B23-Oc0073458	NCP	%	88			70-130	Pass	
Fluoranthene	B23-No0001112	NCP	%	106			70-130	Pass	
Fluorene	B23-No0001112	NCP	%	96			70-130	Pass	
Indeno(1.2.3-cd)pyrene	B23-No0001112	NCP	%	85			70-130	Pass	
Naphthalene	B23-No0001112	NCP	%	99			70-130	Pass	
Phenanthrene	B23-No0001112	NCP	%	84			70-130	Pass	
Pyrene	B23-No0001112	NCP	%	94			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S23-Oc0068507	NCP	%	91			70-130	Pass	
4.4'-DDD	S23-Oc0068507	NCP	%	84			70-130	Pass	
4.4'-DDE	S23-Oc0068507	NCP	%	78			70-130	Pass	
4.4'-DDT	S23-Oc0068507	NCP	%	78			70-130	Pass	
a-HCH	S23-Oc0068507	NCP	%	91			70-130	Pass	
Aldrin	S23-Oc0068507	NCP	%	96			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
b-HCH	S23-Oc0068507	NCP	%	75			70-130	Pass	
d-HCH	S23-Oc0068507	NCP	%	93			70-130	Pass	
Dieldrin	S23-Oc0068507	NCP	%	100			70-130	Pass	
Endosulfan I	S23-Oc0068507	NCP	%	54			70-130	Fail	Q08
Endrin	S23-Oc0068507	NCP	%	114			70-130	Pass	
g-HCH (Lindane)	S23-Oc0068507	NCP	%	105			70-130	Pass	
Heptachlor	S23-Oc0068507	NCP	%	117			70-130	Pass	
Heptachlor epoxide	S23-Oc0068507	NCP	%	124			70-130	Pass	
Hexachlorobenzene	S23-Oc0068507	NCP	%	105			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S23-Oc0068170	NCP	%	128			70-130	Pass	
Dimethoate	S23-Oc0068170	NCP	%	99			70-130	Pass	
Ethion	S23-Oc0068170	NCP	%	127			70-130	Pass	
Fenitrothion	S23-Oc0068170	NCP	%	100			70-130	Pass	
Methyl parathion	S23-Oc0068170	NCP	%	128			70-130	Pass	
Mevinphos	S23-Oc0068170	NCP	%	110			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	B23-No0001112	NCP	%	86			30-130	Pass	
2.4-Dichlorophenol	B23-Oc0073605	NCP	%	79			30-130	Pass	
2.4.5-Trichlorophenol	B23-No0001112	NCP	%	60			30-130	Pass	
2.4.6-Trichlorophenol	B23-No0001112	NCP	%	83			30-130	Pass	
2.6-Dichlorophenol	B23-No0001112	NCP	%	100			30-130	Pass	
4-Chloro-3-methylphenol	B23-No0001112	NCP	%	86			30-130	Pass	
Pentachlorophenol	B23-Oc0073605	NCP	%	65			30-130	Pass	
Tetrachlorophenols - Total	B23-No0001112	NCP	%	72			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Nitrophenol	B23-No0001112	NCP	%	88			30-130	Pass	
2.4-Dimethylphenol	B23-No0001112	NCP	%	52			30-130	Pass	
2.4-Dinitrophenol	B23-No0001112	NCP	%	94			30-130	Pass	
2-Methylphenol (o-Cresol)	B23-Oc0073458	NCP	%	85			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	B23-No0001112	NCP	%	88			30-130	Pass	
4-Nitrophenol	B23-No0001112	NCP	%	57			30-130	Pass	
Dinoseb	B23-Oc0073605	NCP	%	122			30-130	Pass	
Phenol	B23-No0001112	NCP	%	101			30-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	B23-Oc0072317	CP	%	108			70-130	Pass	
TRH C10-C14	B23-Oc0072317	CP	%	86			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	B23-Oc0072317	CP	%	112			70-130	Pass	
Toluene	B23-Oc0072317	CP	%	110			70-130	Pass	
Ethylbenzene	B23-Oc0072317	CP	%	112			70-130	Pass	
m&p-Xylenes	B23-Oc0072317	CP	%	115			70-130	Pass	
o-Xylene	B23-Oc0072317	CP	%	113			70-130	Pass	
Xylenes - Total*	B23-Oc0072317	CP	%	114			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	B23-Oc0072317	CP	%	105			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH >C10-C16	B23-Oc0072317	CP	%	85			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	B23-Oc0072317	CP	%	90			75-125	Pass	
Cadmium	B23-Oc0072317	CP	%	89			75-125	Pass	
Chromium	B23-Oc0072317	CP	%	94			75-125	Pass	
Copper	B23-Oc0072317	CP	%	93			75-125	Pass	
Lead	B23-Oc0072317	CP	%	98			75-125	Pass	
Mercury	B23-Oc0072317	CP	%	112			75-125	Pass	
Nickel	B23-Oc0072317	CP	%	95			75-125	Pass	
Zinc	B23-Oc0072317	CP	%	92			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	B23-Oc0072321	CP	%	102			70-130	Pass	
TRH C10-C14	B23-Oc0072321	CP	%	84			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	B23-Oc0072321	CP	%	111			70-130	Pass	
Toluene	B23-Oc0072321	CP	%	108			70-130	Pass	
Ethylbenzene	B23-Oc0072321	CP	%	111			70-130	Pass	
m&p-Xylenes	B23-Oc0072321	CP	%	114			70-130	Pass	
o-Xylene	B23-Oc0072321	CP	%	112			70-130	Pass	
Xylenes - Total*	B23-Oc0072321	CP	%	113			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	B23-Oc0072321	CP	%	100			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	B23-Oc0072321	CP	%	83			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	B23-Oc0072321	CP	%	98			75-125	Pass	
Cadmium	B23-Oc0072321	CP	%	97			75-125	Pass	
Chromium	B23-Oc0072321	CP	%	98			75-125	Pass	
Copper	B23-Oc0072321	CP	%	97			75-125	Pass	
Lead	B23-Oc0072321	CP	%	102			75-125	Pass	
Mercury	B23-Oc0072321	CP	%	105			75-125	Pass	
Nickel	B23-Oc0072321	CP	%	97			75-125	Pass	
Zinc	B23-Oc0072321	CP	%	85			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Indeno(1.2.3-cd)pyrene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S23-No0004872	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	S23-Oc0073760	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	S23-Oc0073760	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S23-No0004872	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	S23-No0004872	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S23-Oc0073760	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Monocrotophos	S23-Oc0073760	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S23-Oc0073760	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S23-Oc0073760	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S23-No0004872	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	S23-No0004872	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S23-No0004872	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	S23-No0004872	NCP	mg/kg	0.7	0.6	15	30%	Pass	
Aroclor-1248	S23-No0004872	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	S23-No0004872	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	S23-No0004872	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	S23-No0004872	NCP	mg/kg	0.7	0.6	15	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	B23-Oc0073604	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	B23-Oc0073604	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	B23-Oc0073604	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	B23-Oc0073604	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	B23-Oc0073604	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	B23-Oc0073604	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	B23-Oc0073604	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Nitrophenol	B23-Oc0073604	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	B23-Oc0073604	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	B23-Oc0073604	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	B23-Oc0073604	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	B23-Oc0073604	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	B23-Oc0073604	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	B23-Oc0073604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	S23-No0005402	NCP	%	22	22	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B23-Oc0072319	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	B23-Oc0072319	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	B23-Oc0072319	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B23-Oc0072319	CP	mg/kg	< 50	< 50	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B23-Oc0072319	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B23-Oc0072319	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B23-Oc0072319	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B23-Oc0072319	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	B23-Oc0072319	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	B23-Oc0072319	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B23-Oc0072319	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B23-Oc0072319	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B23-Oc0072319	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B23-Oc0072319	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B23-Oc0072319	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B23-Oc0072319	CP	mg/kg	16	21	25	30%	Pass	
Cadmium	B23-Oc0072319	CP	mg/kg	3.5	4.4	21	30%	Pass	
Chromium	B23-Oc0072319	CP	mg/kg	50	61	21	30%	Pass	
Copper	B23-Oc0072319	CP	mg/kg	49	60	21	30%	Pass	
Lead	B23-Oc0072319	CP	mg/kg	11	14	23	30%	Pass	
Mercury	B23-Oc0072319	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	B23-Oc0072319	CP	mg/kg	56	70	23	30%	Pass	
Zinc	B23-Oc0072319	CP	mg/kg	190	230	22	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B23-Oc0072323	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	B23-Oc0072323	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	B23-Oc0072323	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B23-Oc0072323	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B23-Oc0072323	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B23-Oc0072323	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B23-Oc0072323	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B23-Oc0072323	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	B23-Oc0072323	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	B23-Oc0072323	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B23-Oc0072323	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B23-Oc0072323	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B23-Oc0072323	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B23-Oc0072323	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B23-Oc0072323	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B23-Oc0072323	CP	mg/kg	19	24	19	30%	Pass	
Cadmium	B23-Oc0072323	CP	mg/kg	5.7	7.1	21	30%	Pass	
Chromium	B23-Oc0072323	CP	mg/kg	79	99	23	30%	Pass	
Copper	B23-Oc0072323	CP	mg/kg	80	100	24	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	B23-Oc0072323	CP	mg/kg	16	19	21	30%	Pass	
Mercury	B23-Oc0072323	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	B23-Oc0072323	CP	mg/kg	71	90	25	30%	Pass	
Zinc	B23-Oc0072323	CP	mg/kg	250	320	24	30%	Pass	

Comments

Analysis of Crystalline Silica has been completed by AGON SA, report reference JL4847-13.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised by:

Zoe Flynn	Analytical Services Manager
Jonathon Angell	Senior Analyst-Metal
Jonathon Angell	Senior Analyst-Organic
Jonathon Angell	Senior Analyst-Volatile
Roopesh Rangarajan	Senior Analyst-Organic



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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☑ Brisbane Laboratory
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☐ Perth Laboratory
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd
Address	439 Montague Road, West End Qld 4101
Contact Name	Dawit Bekele
Phone №	0499 289 560
Special Directions	
Purchase Order	
Quote ID №	

Project №	200446.02
Project Name	CopperString 2.0 Project - Julia Creek
Project Manager	Dawit Bekele
EDD Format (ESdat, EQuIS etc)	Esdat
Sampler(s)	Shebin Philip
Handed over by	Shebin Philip
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN
1	JUL-BH1/ 0.0 - 0.2	31/10/23	S	X			
2	JUL-BH1/ 0.3 - 0.5	31/10/23	S				
3	JUL-BH1 / 0.8 - 1.0	31/10/23	S				
4	JUL-BH1/ 1.3 - 1.5	31/10/23	S				
5	JUL-BH2/ 0.0 - 0.2	1/11/23	S	X			
6	JUL-BH2/ 0.3 - 0.5	1/11/23	S				
7	JUL-BH2/ 0.8 - 1.0	1/11/23	S				
8	JUL-BH2/ 1.3 - 1.5	1/11/23	S				
9							
10							
	Total Counts			2			

Containers — Change container type & size if necessary.

№	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Eurofins | mgt Laboratory Use Only						
Received By	DF	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	16/11/23
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	

Name | Signature | Date | Time

Time: 11:05am

Temperature: 8.7 (4)

Report №

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08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd
Address	439 Montague Road, West End Qld 4101
Contact Name	Dawit Bekele
Phone №	0499 289 560
Special Directions	
Purchase Order	
Quote ID №	

Project №	200446.02
Project Name	CopperString 2.0 Project - Julia Creek
Project Manager	Dawit Bekele
EDD Format (ESdat, EQuIS etc)	Esdat
Sampler(s)	Shebin Philip
Handed over by	Shebin Philip
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 5371Da	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	JUL-BH3/ 0.0 - 0.2	1/11/23	S	X		X										
2	JUL-BH3/ 0.3 - 0.5	1/11/23	S													
3	JUL-BH3/ / 0.8 - 1.0	1/11/23	S													
4	JUL-BH3/ 1.3 - 1.5	1/11/23	S													
5	JUL-BH4/ 0.0 - 0.2	1/11/23	S	X												
6	JUL-BH4/ 0.3 - 0.5	1/11/23	S													
7	JUL-BH4/ 0.8 - 1.0	1/11/23	S													
8	JUL-BH4/ 1.3 - 1.5	1/11/23	S													
9																
10																
			Total Counts	2		1										

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Eurofins | mgt Laboratory Use Only						
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Name	Signature	Date / Time
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date / Time	Temperature / Report №

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08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd
Address	439 Montague Road, West End Qld 4101
Contact Name	Dawit Bekele
Phone №	0499 289 560
Special Directions	
Purchase Order	
Quote ID №	

Project №	200446.02
Project Name	CopperString 2.0 Project - Julia Creek
Project Manager	Dawit Bekele
EDD Format (ESdat, EQuIS etc)	Esdat

Sampler(s)	Shebin Philip
Handed over by	Shebin Philip
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses (Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing)

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 5371:a	TRH C6-C10/BTEXN
1	JUL-BH1/ 0.0 - 0.2	31/10/23	S	X			
2	JUL-BH1/ 0.3 - 0.5	31/10/23	S				
3	JUL-BH1 / 0.8 - 1.0	31/10/23	S				
4	JUL-BH1/ 1.3 - 1.5	31/10/23	S				
5	JUL-BH2/ 0.0 - 0.2	1/11/23	S	X			
6	JUL-BH2/ 0.3 - 0.5	1/11/23	S				
7	JUL-BH2/ 0.8 - 1.0	1/11/23	S				
8	JUL-BH2/ 1.3 - 1.5	1/11/23	S				
9							
10							
	Total Counts			2			

Containers (Change container type & size if necessary.)

500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)

Required Turnaround Time (TAT) Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

Sample Comments / Dangerous Goods Hazard Warning

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Eurofins | mgt Laboratory Use Only	Received By	BF	SYD | BNE | MEL | PER | ADL | NTL | DRW	Name		Signature		Date	16/11/23	Time	11:05am	Time	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	8.7 (Y)		
												Report №	

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08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd
Address	439 Montague Road, West End Qld 4101
Contact Name	Dawit Bekele
Phone №	0499 289 560
Special Directions	
Purchase Order	
Quote ID №	

Project №	200446.02
Project Name	CopperString 2.0 Project - Julia Creek
Project Manager	Dawit Bekele
EDD Format (ESdat, EQuIS etc)	Esdat
Sampler(s)	Shebin Philip
Handed over by	Shebin Philip
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

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☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	JUL-BH3/ 0.0 - 0.2	1/11/23	S	X		X										
2	JUL-BH3/ 0.3 - 0.5	1/11/23	S													
3	JUL-BH3/ / 0.8 - 1.0	1/11/23	S													
4	JUL-BH3/ 1.3 - 1.5	1/11/23	S													
5	JUL-BH4/ 0.0 - 0.2	1/11/23	S	X												
6	JUL-BH4/ 0.3 - 0.5	1/11/23	S													
7	JUL-BH4/ 0.8 - 1.0	1/11/23	S													
8	JUL-BH4/ 1.3 - 1.5	1/11/23	S													
9																
10																
			Total Counts	2		1										

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

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Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Name		Signature	
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	
					Time	
					Temperature	
					Report №	

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08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd
Address	439 Montague Road, West End Qld 4101
Contact Name	Dawit Bekele
Phone №	0499 289 560
Special Directions	
Purchase Order	
Quote ID №	

Project №	200446.02
Project Name	CopperString 2.0 Project - Julia Creek
Project Manager	Dawit Bekele
EDD Format (ESdat, EQuIS etc)	Esdat

Sampler(s)	Shebin Philip
Handed over by	Shebin Philip
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

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☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	JUL-BH5/ 0.0- 0.2	1/11/23	S	X												
2	JUL-BH5/ 0.3 -0.5	1/11/23	S													
3	JUL-BH5 /0.8 -1.0	1/11/23	S													
4	JUL-BH5/ 1.3 - 1.5	1/11/23	S													
5	JUL-BH6/ 0.0 - 0.2	30/10/23	S													
6	JUL-BH6/ 0.3 - 0.5	30/10/23	S	X												
7	JUL-BH6/0.8 - 1.0	30/10/23	S													
8	JUL-BH6/ 1.3 - 1.5	30/10/23	S													
9																
10																
		Total Counts		2												

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal

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	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Name	Signature	Date / Time
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date / Time	Temperature / Report №

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☐ **Melbourne Laboratory**
5 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Julia Creek	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele			Sampler(s)	Shebin Philip
Phone №	0499 289 560			Handed over by	Shebin Philip
Special Directions				Email for Invoice	apinvoices@douglaspartners.com.au
Purchase Order				Email for Results	Dawit.Bekele@douglaspartners.com.au
Quote ID №					

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	Containers: 500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	JUL-BH7/ 0.0- 0.2	1/11/23	S	X												
2	JUL-BH7/ 0.3 - 0.5	1/11/23	S													
3	JUL-BH7/ 0.8 - 1.0	1/11/23	S													
4	JUL-BH7/ 1.3 - 1.5	1/11/23	S													
5	JUL-BH8/ 0.0 - 0.2	30/10/23	S	X		X										
6	JUL-BH8/ 0.3 - 0.5	30/10/23	S													
7	JUL-BH8/1.0 - 1.2	30/10/23	S													
8	JUL-BH8/ 1.3 - 1.4	30/10/23	S													
9																
10																
	Total Counts			2		1										

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

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	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Signature	

Date		Time		Date		Time	
Date		Time		Temperature		Report №	

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03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Julia Creek	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Shebin Philip	
Handed over by	Shebin Philip	
Email for Invoice	apinvoices@douglaspartners.com.au	
Email for Results	Dawit.Bekele@douglaspartners.com.au	

Containers (Change container type & size if necessary.)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked.)

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

Analyses (Where metals are requested, please specify Total or Filtered. SUITE code must be used to attract SUITE pricing.)

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 5371Qa	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	JUL-BH9/ 0.0- 0.2	1/11/23	S	X												
2	JUL-BH9/ 0.3 - 0.5	1/11/23	S													
3	JUL-BH9/ 0.8 - 1.0	1/11/23	S													
4	JUL-BH9/ 1.3 - 1.5	1/11/23	S													
5	JUL-BH10/ 0.0- 0.2	31/10/23	S	X												
6	JUL-BH10/ 0.3 - 0.5	31/10/23	S													
7	JUL-BH10/ 0.8 - 1.0	31/10/23	S													
8	JUL-BH10/ 1.3 - 1.5	31/10/23	S													
9	Trip blank						X									
10	Trip Spike						X									
	Total Counts			2			2									

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal Name Signature Date Time

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Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature	
Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №	

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Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

☐ **Sydney Laboratory**
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☑ **Brisbane Laboratory**
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Julia Creek	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Shebin Philip
Handed over by	Shebin Philip
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses — Where meals are requested please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7+B15	Suite B7	Respirable total crystalline silica (RCS) - 5371a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	JUL-BH11/ 0.0- 0.2	31/10/23	S	X												
2	JUL-BH11/ 0.3 - 0.5	31/10/23	S													
3	JUL-BH11/ 0.8 - 1.0	31/10/23	S													
4	JUL-BH11/ 1.3 - 1.5	31/10/23	S													
5	JUL-BH12/ 0.0- 0.2	1/11/23	S	X												
6	JUL-BH12/ 0.3 - 0.5	1/11/23	S													
7	JUL-BH12/ 0.8 - 1.0	1/11/23	S													
8	JUL-BH12/ 1.3 - 1.5	1/11/23	S													
9	R1	1/11/23	S													
10	S1	1/11/23	S													Please send this sample to ALS
			Total Counts	2												

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Name		Signature		Date		Time	

Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time	Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time	Report №

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eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd

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Perth
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Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Christchurch	Tauranga
35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	Douglas Partners (Qld) Pty Ltd
Contact name:	Dawit Bekele
Project name:	COPPERSTRING 2.0 PROJECT - JULIA CREEK
Project ID:	200446.02
Turnaround time:	5 Day
Date/Time received	Nov 16, 2023 11:05 AM
Eurofins reference	1045826

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
NB	Necessary sampling information not provided, the Laboratory will not be responsible for compromised results should testing be performed outside recommended holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Please note: Sample S1 has been forwarded to ALS

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Zoe Flynn on phone : or by email: ZoeFlynn@eurofins.com

Results will be delivered electronically via email to Dawit Bekele - Dawit.Bekele@douglaspartners.com.au.

Note: A copy of these results will also be delivered to the general Douglas Partners (Qld) Pty Ltd email address.

Douglas Partners Pty Ltd
439 Montague Road
West End
QLD 4101

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Dawit Bekele**

Report **1045826-S**
Project name COPPERSTRING 2.0 PROJECT - JULIA CREEK
Project ID 200446.02
Received Date Nov 16, 2023

Client Sample ID			JUL-BH1/0.0-0.2	JUL-BH2/0.0-0.2	JUL-BH3/0.0-0.2	JUL-BH4/0.0-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-No0048198**	**B23-No0048199**	**B23-No0048200**	**B23-No0048201**
Date Sampled			**Oct 31, 2023**	**Oct 31, 2023**	**Oct 31, 2023**	**Oct 31, 2023**
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	82	89	76	76
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			JUL-BH1/0.0-0.2	JUL-BH2/0.0-0.2	JUL-BH3/0.0-0.2	JUL-BH4/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048198	B23-No0048199	B23-No0048200	B23-No0048201
Date Sampled			Oct 31, 2023	Oct 31, 2023	Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	53	64	63	99
p-Terphenyl-d14 (surr.)	1	%	88	106	91	114
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	52	84	74	135
Tetrachloro-m-xylene (surr.)	1	%	59	68	62	118
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			JUL-BH1/0.0-0.2	JUL-BH2/0.0-0.2	JUL-BH3/0.0-0.2	JUL-BH4/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048198	B23-No0048199	B23-No0048200	B23-No0048201
Date Sampled			Oct 31, 2023	Oct 31, 2023	Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	66	67	64	63
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	52	84	74	135
Tetrachloro-m-xylene (surr.)	1	%	59	68	62	118
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1

Client Sample ID			JUL-BH1/0.0-0.2	JUL-BH2/0.0-0.2	JUL-BH3/0.0-0.2	JUL-BH4/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048198	B23-No0048199	B23-No0048200	B23-No0048201
Date Sampled			Oct 31, 2023	Oct 31, 2023	Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Nitrophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	70	64	64	116
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	8.7	7.5	6.2	7.0
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	20	21	18	18
Copper	5	mg/kg	23	27	22	24
Lead	5	mg/kg	27	18	19	14
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	18	20	16	18
Zinc	5	mg/kg	49	64	47	56
Sample Properties						
% Moisture	1	%	3.7	3.3	8.5	2.7
Crystalline Silica			-	-		-

Client Sample ID			JUL-BH5/0.0-0.2	JUL-BH6/0.3-0.5	JUL-BH7/0.0-0.2	JUL-BH8/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048202	B23-No0048203	B23-No0048204	B23-No0048205
Date Sampled			Oct 31, 2023	Oct 31, 2023	Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	101	66	103	103

Client Sample ID			JUL-BH5/0.0-0.2	JUL-BH6/0.3-0.5	JUL-BH7/0.0-0.2	JUL-BH8/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048202	B23-No0048203	B23-No0048204	B23-No0048205
Date Sampled			Oct 31, 2023	Oct 31, 2023	Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	95	91	106	90
p-Terphenyl-d14 (surr.)	1	%	66	117	95	99
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			JUL-BH5/0.0-0.2	JUL-BH6/0.3-0.5	JUL-BH7/0.0-0.2	JUL-BH8/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048202	B23-No0048203	B23-No0048204	B23-No0048205
Date Sampled			Oct 31, 2023	Oct 31, 2023	Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	77	92	80	106
Tetrachloro-m-xylene (surr.)	1	%	61	97	140	105
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			JUL-BH5/0.0-0.2	JUL-BH6/0.3-0.5	JUL-BH7/0.0-0.2	JUL-BH8/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048202	B23-No0048203	B23-No0048204	B23-No0048205
Date Sampled			Oct 31, 2023	Oct 31, 2023	Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	72	85	144	94
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	77	92	80	106
Tetrachloro-m-xylene (surr.)	1	%	61	97	140	105
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Nitrophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	52	92	56	115
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	6.9	6.0	6.6	7.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	21	18	23	22
Copper	5	mg/kg	26	23	25	28
Lead	5	mg/kg	23	19	13	20

Client Sample ID			JUL-BH5/0.0-0.2	JUL-BH6/0.3-0.5	JUL-BH7/0.0-0.2	JUL-BH8/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048202	B23-No0048203	B23-No0048204	B23-No0048205
Date Sampled			Oct 31, 2023	Oct 31, 2023	Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit				
Heavy Metals						
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	20	17	18	20
Zinc	5	mg/kg	58	50	58	60
Sample Properties						
% Moisture	1	%	5.0	11	7.9	13
Crystalline Silica			-	-	-	

Client Sample ID			JUL-BH9/0.0-0.2	JUL-BH10/0.0-0.2	TRIP BLANK	TRIP SPIKE
Sample Matrix			Soil	Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			B23-No0048206	B23-No0048207	B23-No0048208	B23-No0048209
Date Sampled			Oct 31, 2023	Oct 31, 2023	Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	111	94	93	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	-	-
TRH C6-C10	20	mg/kg	< 20	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	-	-
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	-
TRH C6-C10	20	mg/kg	-	-	< 20	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C10-C14	20	mg/kg	< 20	< 20	-	-
TRH C15-C28	50	mg/kg	< 50	< 50	-	-
TRH C29-C36	50	mg/kg	< 50	< 50	-	-
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	-	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	-	-

Client Sample ID			JUL-BH9/0.0-0.2	JUL-BH10/0.0-0.2	TRIP BLANK	TRIP SPIKE
Sample Matrix			Soil	Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			B23-No0048206	B23-No0048207	B23-No0048208	B23-No0048209
Date Sampled			Oct 31, 2023	Oct 31, 2023	Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	-	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	59	91	-	-
p-Terphenyl-d14 (surr.)	1	%	62	103	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	-
a-HCH	0.05	mg/kg	< 0.05	< 0.05	-	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
b-HCH	0.05	mg/kg	< 0.05	< 0.05	-	-
d-HCH	0.05	mg/kg	< 0.05	< 0.05	-	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	-
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	-
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	-	-
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	62	99	-	-
Tetrachloro-m-xylene (surr.)	1	%	65	100	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	-
Bolstar	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	-
Coumaphos	2	mg/kg	< 2	< 2	-	-

Client Sample ID			JUL-BH9/0.0-0.2	JUL-BH10/0.0-0.2	TRIP BLANK	TRIP SPIKE
Sample Matrix			Soil	Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			B23-No0048206	B23-No0048207	B23-No0048208	B23-No0048209
Date Sampled			Oct 31, 2023	Oct 31, 2023	Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	-	-
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	-	-
Diazinon	0.2	mg/kg	< 0.2	< 0.2	-	-
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	-	-
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	-	-
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	-	-
EPN	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethion	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	-
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	-	-
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	-	-
Fenthion	0.2	mg/kg	< 0.2	< 0.2	-	-
Malathion	0.2	mg/kg	< 0.2	< 0.2	-	-
Merphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	-
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Monocrotophos	2	mg/kg	< 2	< 2	-	-
Naled	0.2	mg/kg	< 0.2	< 0.2	-	-
Omethoate	2	mg/kg	< 2	< 2	-	-
Phorate	0.2	mg/kg	< 0.2	< 0.2	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	-
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	-	-
Ronnel	0.2	mg/kg	< 0.2	< 0.2	-	-
Terbufos	0.2	mg/kg	< 0.2	< 0.2	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	-	-
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	-	-
Triphenylphosphate (surr.)	1	%	64	82	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	-	-
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	62	99	-	-
Tetrachloro-m-xylene (surr.)	1	%	65	100	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	-	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	-	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	-	-

Client Sample ID			JUL-BH9/0.0-0.2	JUL-BH10/0.0-0.2	TRIP BLANK	TRIP SPIKE
Sample Matrix			Soil	Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			B23-No0048206	B23-No0048207	B23-No0048208	B23-No0048209
Date Sampled			Oct 31, 2023	Oct 31, 2023	Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit				
Phenols (Halogenated)						
Pentachlorophenol	1	mg/kg	< 1	< 1	-	-
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	-	-
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	-	-
2-Nitrophenol	1.0	mg/kg	< 1	< 1	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	-	-
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	-	-
4-Nitrophenol	5	mg/kg	< 5	< 5	-	-
Dinoseb	20	mg/kg	< 20	< 20	-	-
Phenol	0.5	mg/kg	< 0.5	< 0.5	-	-
Phenol-d6 (surr.)	1	%	70	100	-	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	-	-
TRH >C16-C34	100	mg/kg	< 100	< 100	-	-
TRH >C34-C40	100	mg/kg	< 100	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	-	-
Heavy Metals						
Arsenic	2	mg/kg	7.1	7.1	-	-
Cadmium	0.4	mg/kg	< 0.4	3.5	-	-
Chromium	5	mg/kg	19	13	-	-
Copper	5	mg/kg	26	31	-	-
Lead	5	mg/kg	15	5.7	-	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	-
Nickel	5	mg/kg	18	24	-	-
Zinc	5	mg/kg	57	86	-	-
Sample Properties						
% Moisture	1	%	5.7	1.9	-	-
Naphthalene[N02]	0.5	mg/kg	-	-	< 0.5	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	< 20	-
Naphthalene	1	%	-	-	-	64
TRH C6-C10	1	%	-	-	-	43
TRH C6-C9	1	%	-	-	-	41
BTEX						
Benzene	1	%	-	-	-	40
Ethylbenzene	1	%	-	-	-	33
m&p-Xylenes	1	%	-	-	-	41
o-Xylene	1	%	-	-	-	29
Toluene	1	%	-	-	-	35
Xylenes - Total	1	%	-	-	-	34
4-Bromofluorobenzene (surr.)	1	%	-	-	-	104

Client Sample ID			JUL-BH11/0.0-0.2	JUL-BH12/0.0-0.2
Sample Matrix			Soil	Soil
Eurofins Sample No.			B23-No0048210	B23-No0048211
Date Sampled			Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit		
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	109	76
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20
Total Recoverable Hydrocarbons				
TRH C6-C9	20	mg/kg	< 20	< 20
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	97	72
p-Terphenyl-d14 (surr.)	1	%	117	79
Organochlorine Pesticides				
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05

Client Sample ID			JUL-BH11/0.0-0.2	JUL-BH12/0.0-0.2
Sample Matrix			Soil	Soil
Eurofins Sample No.			B23-No0048210	B23-No0048211
Date Sampled			Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit		
Organochlorine Pesticides				
Aldrin	0.05	mg/kg	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	86	81
Tetrachloro-m-xylene (surr.)	1	%	53	94
Organophosphorus Pesticides				
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2

Client Sample ID			JUL-BH11/0.0-0.2	JUL-BH12/0.0-0.2
Sample Matrix			Soil	Soil
Eurofins Sample No.			B23-No0048210	B23-No0048211
Date Sampled			Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit		
Organophosphorus Pesticides				
Omethoate	2	mg/kg	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	72	98
Polychlorinated Biphenyls				
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	86	81
Tetrachloro-m-xylene (surr.)	1	%	53	94
Phenols (Halogenated)				
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1
Phenols (non-Halogenated)				
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5
2-Nitrophenol	1.0	mg/kg	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	69	83
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20

Client Sample ID			JUL-BH11/0.0-0.2	JUL-BH12/0.0-0.2
Sample Matrix			Soil	Soil
Eurofins Sample No.			B23-No0048210	B23-No0048211
Date Sampled			Oct 31, 2023	Oct 31, 2023
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100
Heavy Metals				
Arsenic	2	mg/kg	11	9.5
Cadmium	0.4	mg/kg	< 0.4	0.5
Chromium	5	mg/kg	26	20
Copper	5	mg/kg	33	34
Lead	5	mg/kg	19	19
Mercury	0.1	mg/kg	< 0.1	< 0.1
Nickel	5	mg/kg	24	24
Zinc	5	mg/kg	78	82
Sample Properties				
% Moisture	1	%	33	1.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
BTEX	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
- Method: USEPA SW846 8260			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Naphthalene	Melbourne	Nov 22, 2023	
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
- Method: USEPA 8260B - MGT 350A Volatile Organics by GCMS			
Eurofins Suite B7A			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Melbourne	Nov 22, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B15			
Organochlorine Pesticides	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)			
Organophosphorus Pesticides	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8270)			
Polychlorinated Biphenyls	Melbourne	Nov 22, 2023	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)			
% Moisture	Melbourne	Nov 20, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Crystalline Silica	Melbourne	Nov 20, 2023	10 Days
- Method:			

eurofins

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Eurofins Environment Testing Australia Pty Ltd
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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
West End
QLD 4101

Order No.:
Report #: 1045826
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Nov 16, 2023 11:05 AM
Due: Nov 23, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 2.0 PROJECT - JULIA CREEK
Project ID: 200446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail	Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254			X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794		X			X	X	X
External Laboratory	X						

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	JUL-BH1/0.0-0.2	Oct 31, 2023		Soil	B23-No0048198			X	X	X		
2	JUL-BH2/0.0-0.2	Oct 31, 2023		Soil	B23-No0048199			X	X	X		
3	JUL-BH3/0.0-0.2	Oct 31, 2023		Soil	B23-No0048200	X		X	X	X		
4	JUL-BH4/0.0-0.2	Oct 31, 2023		Soil	B23-No0048201			X	X	X		
5	JUL-BH5/0.0-0.2	Oct 31, 2023		Soil	B23-No0048202			X	X	X		
6	JUL-BH6/0.3-0.5	Oct 31, 2023		Soil	B23-No0048203			X	X	X		
7	JUL-BH7/0.0-0.2	Oct 31, 2023		Soil	B23-No0048204			X	X	X		

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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
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QLD 4101

Order No.:
Report #: 1045826
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Nov 16, 2023 11:05 AM
Due: Nov 23, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 2.0 PROJECT - JULIA CREEK
Project ID: 200446.02

Eurofins Analytical Services Manager : Zoe Flynn

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Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X
8	JUL-BH8/0.0-0.2	Oct 31, 2023		Soil	B23-No0048205	X		X	X	X		
9	JUL-BH9/0.0-0.2	Oct 31, 2023		Soil	B23-No0048206			X	X	X		
10	JUL-BH10/0.0-0.2	Oct 31, 2023		Soil	B23-No0048207			X	X	X		
11	TRIP BLANK	Oct 31, 2023		Trip Blank (solid)	B23-No0048208						X	
12	TRIP SPIKE	Oct 31, 2023		Trip Spike (solid)	B23-No0048209							X
13	JUL-BH11/0.0-0.2	Oct 31, 2023		Soil	B23-No0048210			X	X	X		
14	JUL-BH12/0.0-0.2	Oct 31, 2023		Soil	B23-No0048211			X	X	X		
15	JUL-BH1/0.3-0.5	Oct 31, 2023		Soil	B23-No0048212		X					
16	JUL-BH1/0.8-1.0	Oct 31, 2023		Soil	B23-No0048213		X					

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X
17	JUL-BH1/1.3-1.5	Oct 31, 2023		Soil	B23-No0048214		X					
18	JUL-BH2/0.3-0.5	Oct 31, 2023		Soil	B23-No0048215		X					
19	JUL-BH2/0.8-1.0	Oct 31, 2023		Soil	B23-No0048216		X					
20	JUL-BH2/1.3-1.5	Oct 31, 2023		Soil	B23-No0048217		X					
21	JUL-BH3/0.3-0.5	Oct 31, 2023		Soil	B23-No0048218		X					
22	JUL-BH3/0.8-1.0	Oct 31, 2023		Soil	B23-No0048219		X					
23	JUL-BH3/1.3-1.5	Oct 31, 2023		Soil	B23-No0048220		X					
24	JUL-BH4/0.3-0.5	Oct 31, 2023		Soil	B23-No0048221		X					
25	JUL-BH4/0.8-1.0	Oct 31, 2023		Soil	B23-No0048222		X					

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X
26	JUL-BH4/1.3-1.5	Oct 31, 2023		Soil	B23-No0048223		X					
27	JUL-BH5/0.3-0.5	Oct 31, 2023		Soil	B23-No0048224		X					
28	JUL-BH5/0.8-1.0	Oct 31, 2023		Soil	B23-No0048225		X					
29	JUL-BH5/1.3-1.5	Oct 31, 2023		Soil	B23-No0048226		X					
30	JUL-BH6/0.0-0.2	Oct 31, 2023		Soil	B23-No0048227		X					
31	JUL-BH6/0.8-1.0	Oct 31, 2023		Soil	B23-No0048228		X					
32	JUL-BH6/1.3-1.5	Oct 31, 2023		Soil	B23-No0048229		X					
33	JUL-BH7/0.3-0.5	Oct 31, 2023		Soil	B23-No0048230		X					
34	JUL-BH7/0.8-1.0	Oct 31, 2023		Soil	B23-No0048231		X					

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X
35	JUL-BH7/1.3-1.5	Oct 31, 2023		Soil	B23-No0048232		X					
36	JUL-BH8/0.3-0.5	Oct 31, 2023		Soil	B23-No0048233		X					
37	JUL-BH8/0.8-1.0	Oct 31, 2023		Soil	B23-No0048234		X					
38	JUL-BH8/1.3-1.5	Oct 31, 2023		Soil	B23-No0048235		X					
39	JUL-BH9/0.3-0.5	Oct 31, 2023		Soil	B23-No0048236		X					
40	JUL-BH9/0.8-1.0	Oct 31, 2023		Soil	B23-No0048237		X					
41	JUL-BH9/1.3-1.5	Oct 31, 2023		Soil	B23-No0048238		X					
42	JUL-BH10/0.3-0.5	Oct 31, 2023		Soil	B23-No0048239		X					
43	JUL-BH10/0.8-1.0	Oct 31, 2023		Soil	B23-No0048240		X					

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X
44	JUL-BH10/1.3-1.5	Oct 31, 2023		Soil	B23-No0048241		X					
45	JUL-BH11/0.3-0.5	Oct 31, 2023		Soil	B23-No0048242		X					
46	JUL-BH11/0.8-1.0	Oct 31, 2023		Soil	B23-No0048243		X					
47	JUL-BH11/1.3-1.5	Oct 31, 2023		Soil	B23-No0048244		X					
48	JUL-BH12/0.3-0.5	Oct 31, 2023		Soil	B23-No0048245		X					
49	JUL-BH12/0.8-1.0	Oct 31, 2023		Soil	B23-No0048246		X					
50	JUL-BH12/1.3-1.5	Oct 31, 2023		Soil	B23-No0048247		X					
51	R1	Oct 31, 2023		Soil	B23-No0048248		X					
52	JUL-BH10/0.1-0.2	Oct 31, 2023		Soil	B23-No0048249		X					

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Detail	Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254			X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794		X			X	X	X
Test Counts	2	38	12	12	12	1	1

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30%; however the following acceptance guidelines are equally applicable: Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported, have been reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/kg	< 20			20	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 10			10	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	93			70-130	Pass	
Toluene	%	89			70-130	Pass	
Ethylbenzene	%	89			70-130	Pass	
m&p-Xylenes	%	101			70-130	Pass	
Xylenes - Total*	%	100			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	100			70-130	Pass	
TRH C6-C10	%	113			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	98			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C10-C14	%	112			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	111			70-130	Pass	
Acenaphthylene	%	118			70-130	Pass	
Anthracene	%	82			70-130	Pass	
Benz(a)anthracene	%	108			70-130	Pass	
Benzo(a)pyrene	%	103			70-130	Pass	
Benzo(b&j)fluoranthene	%	119			70-130	Pass	
Benzo(g.h.i)perylene	%	95			70-130	Pass	
Benzo(k)fluoranthene	%	108			70-130	Pass	
Chrysene	%	110			70-130	Pass	
Dibenz(a.h)anthracene	%	84			70-130	Pass	
Fluoranthene	%	113			70-130	Pass	
Fluorene	%	116			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	90			70-130	Pass	
Naphthalene	%	110			70-130	Pass	
Phenanthrene	%	105			70-130	Pass	
Pyrene	%	117			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	99			70-130	Pass	
4.4'-DDD	%	102			70-130	Pass	
4.4'-DDE	%	105			70-130	Pass	
4.4'-DDT	%	116			70-130	Pass	
a-HCH	%	98			70-130	Pass	
Aldrin	%	97			70-130	Pass	
b-HCH	%	110			70-130	Pass	
d-HCH	%	104			70-130	Pass	
Dieldrin	%	94			70-130	Pass	
Endosulfan I	%	104			70-130	Pass	
Endosulfan II	%	99			70-130	Pass	
Endosulfan sulphate	%	110			70-130	Pass	
Endrin	%	103			70-130	Pass	
Endrin aldehyde	%	90			70-130	Pass	
Endrin ketone	%	114			70-130	Pass	
g-HCH (Lindane)	%	104			70-130	Pass	
Heptachlor	%	103			70-130	Pass	
Heptachlor epoxide	%	97			70-130	Pass	
Hexachlorobenzene	%	104			70-130	Pass	
Methoxychlor	%	115			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	88			70-130	Pass	
Dimethoate	%	113			70-130	Pass	
Ethion	%	95			70-130	Pass	
Fenitrothion	%	98			70-130	Pass	
Methyl parathion	%	85			70-130	Pass	
Mevinphos	%	75			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	115			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-Chlorophenol	%	106			25-140	Pass	
2.4-Dichlorophenol	%	87			25-140	Pass	
2.4.5-Trichlorophenol	%	57			25-140	Pass	
2.4.6-Trichlorophenol	%	80			25-140	Pass	
2.6-Dichlorophenol	%	85			25-140	Pass	
4-Chloro-3-methylphenol	%	91			25-140	Pass	
Pentachlorophenol	%	70			25-140	Pass	
Tetrachlorophenols - Total	%	49			25-140	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	49			25-140	Pass	
2-Methyl-4.6-dinitrophenol	%	62			25-140	Pass	
2-Nitrophenol	%	86			25-140	Pass	
2.4-Dimethylphenol	%	47			25-140	Pass	
2.4-Dinitrophenol	%	115			25-140	Pass	
2-Methylphenol (o-Cresol)	%	83			25-140	Pass	
3&4-Methylphenol (m&p-Cresol)	%	98			25-140	Pass	
4-Nitrophenol	%	44			25-140	Pass	
Dinoseb	%	48			25-140	Pass	
Phenol	%	114			25-140	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	110			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	108			80-120	Pass	
Cadmium	%	116			80-120	Pass	
Chromium	%	114			80-120	Pass	
Copper	%	113			80-120	Pass	
Lead	%	113			80-120	Pass	
Mercury	%	116			80-120	Pass	
Nickel	%	110			80-120	Pass	
Zinc	%	110			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX				Result 1					
Benzene	M23-No0055441	NCP	%	72			70-130	Pass	
Toluene	M23-No0055441	NCP	%	82			70-130	Pass	
Ethylbenzene	M23-No0055441	NCP	%	87			70-130	Pass	
m&p-Xylenes	M23-No0055441	NCP	%	88			70-130	Pass	
o-Xylene	M23-No0055441	NCP	%	91			70-130	Pass	
Xylenes - Total*	M23-No0055441	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M23-No0055441	NCP	%	130			70-130	Pass	
TRH C6-C10	M23-No0055441	NCP	%	88			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	M23-No0055441	NCP	%	94			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M23-No0053166	NCP	%	101			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthene	M23-No0048822	NCP	%	96			70-130	Pass	
Acenaphthylene	M23-No0048822	NCP	%	98			70-130	Pass	
Anthracene	M23-No0048822	NCP	%	90			70-130	Pass	
Benz(a)anthracene	M23-No0048822	NCP	%	104			70-130	Pass	
Benzo(a)pyrene	M23-No0048822	NCP	%	105			70-130	Pass	
Benzo(b&j)fluoranthene	M23-No0048822	NCP	%	83			70-130	Pass	
Benzo(g.h.i)perylene	M23-No0048822	NCP	%	121			70-130	Pass	
Benzo(k)fluoranthene	M23-No0048822	NCP	%	77			70-130	Pass	
Chrysene	M23-No0048822	NCP	%	112			70-130	Pass	
Dibenz(a.h)anthracene	M23-No0048822	NCP	%	102			70-130	Pass	
Fluoranthene	M23-No0048822	NCP	%	85			70-130	Pass	
Fluorene	M23-No0048822	NCP	%	83			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M23-No0048822	NCP	%	99			70-130	Pass	
Naphthalene	M23-No0048822	NCP	%	100			70-130	Pass	
Phenanthrene	M23-No0048822	NCP	%	118			70-130	Pass	
Pyrene	M23-No0048822	NCP	%	71			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M23-No0051306	NCP	%	107			70-130	Pass	
4.4'-DDD	M23-No0051306	NCP	%	102			70-130	Pass	
4.4'-DDE	M23-No0051306	NCP	%	116			70-130	Pass	
4.4'-DDT	M23-No0051306	NCP	%	81			70-130	Pass	
a-HCH	M23-No0051306	NCP	%	83			70-130	Pass	
Aldrin	M23-No0051306	NCP	%	95			70-130	Pass	
b-HCH	M23-No0051306	NCP	%	94			70-130	Pass	
d-HCH	M23-No0051306	NCP	%	71			70-130	Pass	
Dieldrin	M23-No0051306	NCP	%	79			70-130	Pass	
Endosulfan I	M23-No0051306	NCP	%	100			70-130	Pass	
Endosulfan II	M23-No0051306	NCP	%	127			70-130	Pass	
Endosulfan sulphate	M23-No0051306	NCP	%	71			70-130	Pass	
Endrin	M23-No0051306	NCP	%	100			70-130	Pass	
Endrin aldehyde	M23-No0051306	NCP	%	81			70-130	Pass	
Endrin ketone	M23-No0051306	NCP	%	95			70-130	Pass	
g-HCH (Lindane)	M23-No0051306	NCP	%	98			70-130	Pass	
Heptachlor	M23-No0051306	NCP	%	92			70-130	Pass	
Heptachlor epoxide	M23-No0051306	NCP	%	121			70-130	Pass	
Hexachlorobenzene	M23-No0051306	NCP	%	106			70-130	Pass	
Methoxychlor	M23-No0051306	NCP	%	119			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M23-No0048822	NCP	%	94			30-130	Pass	
2.4-Dichlorophenol	M23-No0048822	NCP	%	35			30-130	Pass	
2.4.5-Trichlorophenol	M23-No0048822	NCP	%	105			30-130	Pass	
2.6-Dichlorophenol	M23-No0048822	NCP	%	36			30-130	Pass	
4-Chloro-3-methylphenol	M23-No0048822	NCP	%	49			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M23-No0048822	NCP	%	98			30-130	Pass	
2-Nitrophenol	M23-No0048822	NCP	%	47			30-130	Pass	
2.4-Dimethylphenol	M23-No0048822	NCP	%	76			30-130	Pass	
2-Methylphenol (o-Cresol)	M23-No0048822	NCP	%	68			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M23-No0048822	NCP	%	95			30-130	Pass	
Dinoseb	M23-No0048822	NCP	%	97			30-130	Pass	
Phenol	M23-No0048822	NCP	%	88			30-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M23-No0053166	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M23-No0054011	NCP	%	101			75-125	Pass	
Cadmium	M23-No0054011	NCP	%	98			75-125	Pass	
Chromium	M23-No0054011	NCP	%	105			75-125	Pass	
Copper	M23-No0053587	NCP	%	105			75-125	Pass	
Lead	M23-No0054011	NCP	%	136			75-125	Fail	Q08
Mercury	M23-No0054011	NCP	%	108			75-125	Pass	
Nickel	M23-No0054011	NCP	%	104			75-125	Pass	
Zinc	M23-No0054011	NCP	%	79			75-125	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2.4.6-Trichlorophenol	M23-No0048476	NCP	%	31			30-130	Pass	
Pentachlorophenol	M23-No0035383	NCP	%	37			30-130	Pass	
Tetrachlorophenols - Total	M23-No0042859	NCP	%	110			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Methyl-4.6-dinitrophenol	M23-No0042859	NCP	%	58			30-130	Pass	
2.4-Dinitrophenol	M23-No0030958	NCP	%	75			30-130	Pass	
4-Nitrophenol	M23-No0035414	NCP	%	34			30-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	B23-No0048207	CP	%	103			70-130	Pass	
Dimethoate	B23-No0048207	CP	%	95			70-130	Pass	
Ethion	B23-No0048207	CP	%	103			70-130	Pass	
Fenitrothion	B23-No0048207	CP	%	104			70-130	Pass	
Methyl parathion	B23-No0048207	CP	%	114			70-130	Pass	
Mevinphos	B23-No0048207	CP	%	111			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	M23-No0044385	NCP	%	78			70-130	Pass	
Aroclor-1260	M23-No0044385	NCP	%	82			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M23-No0048555	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M23-No0048555	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M23-No0048555	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M23-No0048555	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M23-No0048555	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M23-No0048555	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M23-No0048555	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M23-No0048555	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	M23-No0048555	NCP	mg/kg	< 20	< 20	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M23-No0054010	NCP	mg/kg	3.8	4.3	11	30%	Pass	
Cadmium	M23-No0054010	NCP	mg/kg	0.5	0.5	6.1	30%	Pass	
Chromium	M23-No0054010	NCP	mg/kg	17	20	14	30%	Pass	
Copper	M23-No0054010	NCP	mg/kg	45	63	34	30%	Fail	Q15
Lead	M23-No0054010	NCP	mg/kg	190	180	4.0	30%	Pass	
Mercury	M23-No0054010	NCP	mg/kg	0.1	0.1	5.3	30%	Pass	
Nickel	M23-No0054010	NCP	mg/kg	7.5	7.2	2.9	30%	Pass	
Zinc	M23-No0054010	NCP	mg/kg	170	150	15	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	B23-No0048205	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	B23-No0048205	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B23-No0048205	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	B23-No0048205	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	B23-No0048205	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	B23-No0048205	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	B23-No0048205	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	B23-No0048205	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	B23-No0048205	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	B23-No0048205	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	B23-No0048205	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	B23-No0048205	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	B23-No0048205	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	B23-No0048205	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	B23-No0048205	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	B23-No0048205	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	B23-No0048205	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	B23-No0048205	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	B23-No0048205	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	B23-No0048205	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	B23-No0048205	CP	mg/kg	< 10	< 10	<1	30%	Pass	

Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	B23-No0048205	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	B23-No0048205	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Nitrophenol	B23-No0048205	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	B23-No0048205	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	B23-No0048205	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	B23-No0048205	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	B23-No0048205	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	B23-No0048205	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	B23-No0048205	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B23-No0048205	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B23-No0048205	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B23-No0048205	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	B23-No0048206	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	B23-No0048206	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B23-No0048206	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	B23-No0048206	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endrin ketone	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	B23-No0048206	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	B23-No0048206	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	B23-No0048206	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	B23-No0048206	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	B23-No0048206	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	B23-No0048206	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	B23-No0048206	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	B23-No0048206	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	B23-No0048206	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	B23-No0048206	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	B23-No0048206	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	B23-No0048206	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	B23-No0048206	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	B23-No0048206	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	B23-No0048206	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	B23-No0048206	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	B23-No0048206	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	B23-No0048206	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	B23-No0048206	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Nitrophenol	B23-No0048206	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	B23-No0048206	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	B23-No0048206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	B23-No0048206	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	B23-No0048206	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	B23-No0048206	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	B23-No0048206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B23-No0048206	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B23-No0048206	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B23-No0048206	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	B23-No0048206	CP	%	5.7	7.2	22	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	No
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Zoe Flynn	Analytical Services Manager
Joseph Edouard	Senior Analyst-Volatile
Mary Makarios	Senior Analyst-Metal
Joseph Edouard	Senior Analyst-Organic
Mary Makarios	Senior Analyst-Sample Properties
Edward Lee	Senior Analyst-Organic
Jonathon Angell	Senior Analyst-Volatile
Harry Bacalis	Senior Analyst-Volatile
Emily Rosenberg	Senior Analyst-Metal



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ Newcastle: 6 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E: townsville.environmental@alsenviro.com
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5096 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	Douglas Partners Pty Ltd	**TURNAROUND REQUIREMENTS $:** (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE:	Brisbane		
PROJECT:	200446.02	**ALS QUOTE NO.:**	EN-222-18
ORDER NUMBER:			
PROJECT MANAGER:	Dawit Bekele	CONTACT PH:	0499 289 560
SAMPLER:	Shebin Philip	**SAMPLER MOBILE:**	
COC emailed to ALS? (YES / NO)		**EDD FORMAT (or default):**	
Email Reports to	dawit.bekele@douglaspartners.com.au		
Email Invoice to	apinvoices@douglaspartners.com.au		

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 4 5 6 7
2 3 4 5 6 7

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Dawit Bekele / Eurofins	Arsh		
DATE/TIME:	DATE/TIME: 21-11-23 19:15	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	s-28								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
2.	S2 (PEN-BH8/ 1.3 - 1.4)	3/11/2023	S	-	1	x								Sample to be sent by Eurofins
				TOTAL	1	1	0	0	0	0	0	0	0	

Water Container Codes: *P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.*

CERTIFICATE OF ANALYSIS

Work Order	: **EB2336640**	Page	: 1 of 6
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: DAWIT BEKELE	Contact	: John Pickering
Address	: 439 MONTAGUE ROAD WEST END QLD, AUSTRALIA 4101	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61 7 3552 8634
Project	: 200446.02 CopperString 2.0 Project - Julia Creek	Date Samples Received	: 21-Nov-2023 19:15
Order number	: ----	Date Analysis Commenced	: 22-Nov-2023
C-O-C number	: ----	Issue Date	: 29-Nov-2023 14:04
Sampler	: SHEBIN PHILIP		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Soil Preparation, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EG005T (Total Metals by ICP-AES): EB2336624-001 shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	S2 (PEN-BH8/ 1.3 - 1.4)	----	----	----	----
				Sampling date / time	03-Nov-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2336640-002	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		**16.8**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		**8**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg		**11**	----	----	----	----
Copper	7440-50-8	5	mg/kg		**28**	----	----	----	----
Lead	7439-92-1	5	mg/kg		**10**	----	----	----	----
Nickel	7440-02-0	2	mg/kg		**17**	----	----	----	----
Zinc	7440-66-6	5	mg/kg		**59**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	S2 (PEN-BH8/ 1.3 - 1.4)	----	----	----	----
				Sampling date / time	03-Nov-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2336640-002	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**0.6**	----	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	S2 (PEN-BH8/ 1.3 - 1.4)	----	----	----	----
				Sampling date / time	03-Nov-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2336640-002	--------	--------	--------	--------
					Result	----	----	----	----
EP080: BTEXN - Continued									
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**89.8**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**98.6**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**92.9**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**128**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**91.8**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**120**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**92.0**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**93.8**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**100**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	35	154
2-Chlorophenol-D4	93951-73-6	42	153
2.4.6-Tribromophenol	118-79-6	26	157
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	34	156
Anthracene-d10	1719-06-8	37	153
4-Terphenyl-d14	1718-51-0	42	172
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	53	134
Toluene-D8	2037-26-5	60	131
4-Bromofluorobenzene	460-00-4	59	127

QUALITY CONTROL REPORT

Work Order	: **EB2336640**	Page	: 1 of 6
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: DAWIT BEKELE	Contact	: John Pickering
Address	: 439 MONTAGUE ROAD WEST END QLD, AUSTRALIA 4101	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61 7 3552 8634
Project	: 200446.02 CopperString 2.0 Project - Julia Creek	Date Samples Received	: 21-Nov-2023
Order number	: ----	Date Analysis Commenced	: 22-Nov-2023
C-O-C number	: ----	Issue Date	: 29-Nov-2023
Sampler	: SHEBIN PHILIP		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Soil Preparation, Stafford, QLD

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Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5442066)									
EB2336624-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	16	20	17.9	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	11	13	14.7	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	7	23.1	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	53	51	2.2	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	38	39	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	130	# 98	28.5	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5442080)									
EB2336101-001	Anonymous	EA055: Moisture Content	----	0.1	%	0.4	0.4	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5442067)									
EB2336624-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.3	0.2	42.1	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5443322)									
EB2336640-002	S2 (PEN-BH8/ 1.3 - 1.4)	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5443322) - continued									
EB2336640-002	S2 (PEN-BH8/ 1.3 - 1.4)	EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5442074)									
EB2336101-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5443323)									
EB2336640-002	S2 (PEN-BH8/ 1.3 - 1.4)	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5442074)									
EB2336101-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5443323)									
EB2336640-002	S2 (PEN-BH8/ 1.3 - 1.4)	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 5442074)									
EB2336101-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	1.0	1.0	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	1.0	1.0	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5442066)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	62.7 mg/kg	104	84.0	123
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
EG005T: Chromium	7440-47-3	2	mg/kg	<2	13.9 mg/kg	106	83.0	125
EG005T: Copper	7440-50-8	5	mg/kg	<5	37.2 mg/kg	107	86.0	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	44.9 mg/kg	113	84.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	12.07 mg/kg	105	81.5	118
EG005T: Zinc	7440-66-6	5	mg/kg	<5	140.7 mg/kg	117	80.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5442067)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.11274 mg/kg	104	70.0	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5443322)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	1.5 mg/kg	97.8	72.6	133
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	1.5 mg/kg	97.4	63.2	144
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	1.5 mg/kg	91.3	66.0	132
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	1.5 mg/kg	84.7	76.2	134
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	1.5 mg/kg	117	71.8	137
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	1.5 mg/kg	94.1	77.1	143
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	1.5 mg/kg	119	74.1	140
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	1.5 mg/kg	118	72.0	139
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	1.5 mg/kg	76.7	58.0	145
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	1.5 mg/kg	97.4	63.0	147
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	1.5 mg/kg	85.5	70.5	142
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	1.5 mg/kg	98.7	75.5	138
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	1.5 mg/kg	88.6	68.5	140
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	1.5 mg/kg	98.8	58.4	143
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	1.5 mg/kg	95.0	52.1	149
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	1.5 mg/kg	94.8	64.6	140
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5442074)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	18 mg/kg	97.0	64.0	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5443323)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	378 mg/kg	96.9	79.4	125

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5443323) - continued								
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	407 mg/kg	97.9	78.8	122
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5442074)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	22.5 mg/kg	94.4	58.1	124
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5443323)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	502 mg/kg	95.6	81.0	132
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	268 mg/kg	104	67.2	130
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
EP080: BTEXN (QCLot: 5442074)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	88.0	68.0	107
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	88.2	69.0	108
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	91.6	68.0	109
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	93.2	70.0	114
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	91.9	74.0	116
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	89.3	74.0	109

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5442066)							
EB2336640-002	S2 (PEN-BH8/ 1.3 - 1.4)	EG005T: Arsenic	7440-38-2	50 mg/kg	83.8	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	88.5	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	89.1	70.0	130
		EG005T: Copper	7440-50-8	250 mg/kg	93.1	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	92.6	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	88.6	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	85.7	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5442067)							
EB2336640-002	S2 (PEN-BH8/ 1.3 - 1.4)	EG035T: Mercury	7439-97-6	0.5 mg/kg	93.4	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5442074)							
EB2336640-002	S2 (PEN-BH8/ 1.3 - 1.4)	EP080: C6 - C9 Fraction	----	8 mg/kg	92.4	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5442074)							
EB2336640-002	S2 (PEN-BH8/ 1.3 - 1.4)	EP080: C6 - C10 Fraction	C6_C10	8 mg/kg	85.3	70.0	130
EP080: BTEXN (QCLot: 5442074)							
EB2336640-002	S2 (PEN-BH8/ 1.3 - 1.4)	EP080: Benzene	71-43-2	2 mg/kg	90.7	70.0	130
		EP080: Toluene	108-88-3	2 mg/kg	88.7	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2336640**	Page	: 1 of 5
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: DAWIT BEKELE	Telephone	: +61 7 3552 8634
Project	: 200446.02 CopperString 2.0 Project - Julia Creek	Date Samples Received	: 21-Nov-2023
Site	: ----	Issue Date	: 29-Nov-2023
Sampler	: SHEBIN PHILIP	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005(ED093)T: Total Metals by ICP-AES	EB2336624--001	Anonymous	**Zinc**	7440-66-6	28.5 %	0% - 20%	**RPD exceeds LOR based limits**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA055: Moisture Content (Dried @ 105-110°C)						
Soil Glass Jar - Unpreserved S2 (PEN-BH8/ 1.3 - 1.4)	----	----	----	22-Nov-2023	17-Nov-2023	**5**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
Soil Glass Jar - Unpreserved S2 (PEN-BH8/ 1.3 - 1.4)	23-Nov-2023	17-Nov-2023	**6**	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
Soil Glass Jar - Unpreserved S2 (PEN-BH8/ 1.3 - 1.4)	23-Nov-2023	17-Nov-2023	**6**	23-Nov-2023	17-Nov-2023	**6**
Soil Glass Jar - Unpreserved S2 (PEN-BH8/ 1.3 - 1.4)	23-Nov-2023	17-Nov-2023	**6**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions						
Soil Glass Jar - Unpreserved S2 (PEN-BH8/ 1.3 - 1.4)	23-Nov-2023	17-Nov-2023	**6**	23-Nov-2023	17-Nov-2023	**6**
Soil Glass Jar - Unpreserved S2 (PEN-BH8/ 1.3 - 1.4)	23-Nov-2023	17-Nov-2023	**6**	----	----	----
EP080: BTEXN						
Soil Glass Jar - Unpreserved S2 (PEN-BH8/ 1.3 - 1.4)	23-Nov-2023	17-Nov-2023	**6**	23-Nov-2023	17-Nov-2023	**6**

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type / Analytical Methods	Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Matrix Spikes (MS)						
PAH/Phenols (SIM)	EP075(SIM)	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
S2 (PEN-BH8/ 1.3 - 1.4)	**03-Nov-2023**	**----**	----	----	**22-Nov-2023**	17-Nov-2023	×
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
S2 (PEN-BH8/ 1.3 - 1.4)	**03-Nov-2023**	**23-Nov-2023**	01-May-2024	✓	**27-Nov-2023**	01-May-2024	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
S2 (PEN-BH8/ 1.3 - 1.4)	**03-Nov-2023**	**23-Nov-2023**	01-Dec-2023	✓	**27-Nov-2023**	01-Dec-2023	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
S2 (PEN-BH8/ 1.3 - 1.4)	**03-Nov-2023**	**23-Nov-2023**	17-Nov-2023	×	**27-Nov-2023**	02-Jan-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
S2 (PEN-BH8/ 1.3 - 1.4)	**03-Nov-2023**	**23-Nov-2023**	17-Nov-2023	×	**28-Nov-2023**	02-Jan-2024	✓
Soil Glass Jar - Unpreserved (EP080)							
S2 (PEN-BH8/ 1.3 - 1.4)	**03-Nov-2023**	**23-Nov-2023**	17-Nov-2023	×	**23-Nov-2023**	17-Nov-2023	×
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071)							
S2 (PEN-BH8/ 1.3 - 1.4)	**03-Nov-2023**	**23-Nov-2023**	17-Nov-2023	×	**28-Nov-2023**	02-Jan-2024	✓
Soil Glass Jar - Unpreserved (EP080)							
S2 (PEN-BH8/ 1.3 - 1.4)	**03-Nov-2023**	**23-Nov-2023**	17-Nov-2023	×	**23-Nov-2023**	17-Nov-2023	×
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
S2 (PEN-BH8/ 1.3 - 1.4)	**03-Nov-2023**	**23-Nov-2023**	17-Nov-2023	×	**23-Nov-2023**	17-Nov-2023	×

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

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☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Pentland	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Shebin Philip
Handed over by	Shebin Philip
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Containers (Change container type & size if necessary.)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked.)

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	104584	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	PEN-BH1/ 0.0 - 0.2	11/04/23	S	X													
2	PEN-BH1/ 0.3 - 0.5	11/04/23	S														
3	PEN-BH1 / 0.8 - 1.0	11/04/23	S														
4	PEN-BH1/ 1.3 - 1.5	11/04/23	S														
5	PEN-BH2/ 0.0 - 0.2	11/04/23	S	X													
6	PEN-BH2/ 0.3 - 0.5	11/04/23	S														
7	PEN-BH2/ 0.8 - 1.0	11/04/23	S														
8	PEN-BH2/ 1.3 - 1.5	11/04/23	S														
9																	
10																	
		Total Counts		2													

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	
Eurofins | mgt Laboratory Use Only	Received By	DF	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	16/11/23	Time	11:05am	Temperature	8.7 Y
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Pentland	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Shebin Philip
Handed over by	Shebin Philip
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Containers (Change container type & size if necessary.)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked.)

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☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	PEN-BH3/ 0.0 - 0.2	3/11/23	S													
2	PEN--BH3/ 0.3 - 0.5	3/11/23	S	X												
3	PEN-BH3/ / 0.8 - 1.0	3/11/23	S													
4	PEN--BH3/ 1.3 - 1.5	3/11/23	S													
5	PEN-BH4/ 0.0 - 0.2	11/04/23	S	X												
6	PEN-BH4/ 0.3 - 0.5	11/04/23	S													
7	PEN-BH4/ 0.8 - 1.0	11/04/23	S													
8	PEN-BH4/ 1.3 - 1.5	11/04/23	S													
9																
10																
		Total Counts		2												

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal — Name | Signature | Date | Time

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Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature	
Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №	

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6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Pentland	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Shebin Philip		
Handed over by	Shebin Philip		
Email for Invoice	apinvoices@douglaspartners.com.au		
Email for Results	Dawit.Bekele@douglaspartners.com.au		

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	PEN-BH5/ 0.0- 0.2	3/11/23	S	X		X										
2	PEN-BH5/ 0.3 -0.5	3/11/23	S													
3	PEN-BH5 /0.8 -1.0	3/11/23	S													
4	PEN-BH5/ 1.3 - 1.5	3/11/23	S													
5	PEN-BH6/ 0.0 - 0.2	3/11/23	S	X												
6	PEN-BH6/ 0.3 - 0.5	3/11/23	S													
7	PEN-BH6/0.8 - 1.0	3/11/23	S													
8	PEN-BH6/ 1.3 - 1.5	3/11/23	S													
9																
10																
		Total Counts		2		1										

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Pentland	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Shebin Philip	
Handed over by	Shebin Philip	
Email for Invoice	apinvoices@douglaspartners.com.au	
Email for Results	Dawit.Bekele@douglaspartners.com.au	

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☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	PEN-BH7/ 0.0- 0.1	1/11/23	S													
2	PEN-BH7/ 0.1 - 0.2	1/11/23	S	✖												
3	PEN-BH8/ 0.0 - 0.2	3/11/23	S													
4	PEN-BH8/ 0.3 - 0.5	3/11/23	S													
5	PEN-BH8/1.0 - 1.2	3/11/23	S													
6	PEN-BH8/ 1.3 - 1.4	3/11/23	S	✖												
7																
8																
9																
10																
	Total Counts			2												

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal — Name | Signature | Date | Time

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Received By | SYD | BNE | MEL | PER | ADL | NTL | DRW | Signature | Date | Time | Report №

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Company	Douglas Partner Pty Ltd
Address	439 Montague Road, West End Qld 4101
Contact Name	Dawit Bekele
Phone №	0499 289 560
Special Directions	
Purchase Order	
Quote ID №	

Project №	200446.02
Project Name	CopperString 2.0 Project - Pentland
Project Manager	Dawit Bekele
EDD Format (ESdat, EQuIS etc)	Esdat

Sampler(s)	Shebin Philip
Handed over by	Shebin Philip
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time — Default will be 5 days if not ticked

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦
☐ Same day♦
☐ 1 day♦
☐ 2 days♦
☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	PEN--BH9/ 0.0- 0.2	3/11/23	S	X												
2	PEN--BH9/ 0.3 - 0.5	3/11/23	S													
3	PEN--BH9/ 0.8 - 1.0	3/11/23	S													
4	PEN--BH9/ 1.3 - 1.5	3/11/23	S													
5	PEN--BH10/ 0.0- 0.2	3/11/23	S	X												
6	PEN--BH10/ 0.3 - 0.5	3/11/23	S													
7	PEN--BH10/ 0.8 - 1.0	3/11/23	S													
8	PEN--BH10/ 1.3 - 1.5	3/11/23	S													
9	Trip blank						X									
10	Trip Spike						X									
	Total Counts			2			2									

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal

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	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Name		Signature		Date		Time	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
											Report №	

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Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Pentland	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Shebin Philip
Handed over by	Shebin Philip
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN
1	PEN-BH11/ 0.0- 0.2	3/11/23	S	✖		✖	
2	PEN-BH11/ 0.3 - 0.5	3/11/23	S				
3	PEN-BH11/ 0.8 - 1.0	3/11/23	S				
4	PEN-BH11/ 1.3 - 1.5	3/11/23	S				
5	PEN-BH12/ 0.0- 0.2	3/11/23	S	✖			
6	PEN-BH12/ 0.3 - 0.5	3/11/23	S				
7	PEN-BH12/ 0.8 - 1.0	3/11/23	S				
8	PEN-BH12/ 1.3 - 1.5	3/11/23	S				
9	R2	3/11/23	S		✖		
10	S2	3/11/23	S				
	Total Counts			2	1	1	

Containers — Change container type & size if necessary.

500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

Sample Comments / Dangerous Goods Hazard Warning

Please send this sample to ALS with the attached COC

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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Eurofins Environment Testing Australia Pty Ltd

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IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	Douglas Partners (Qld) Pty Ltd
Contact name:	Dawit Bekele
Project name:	COPPERSTRING 2.0 PROJECT- PENTLAND
Project ID:	200446.02
Turnaround time:	5 Day
Date/Time received	Nov 16, 2023 11:05 AM
Eurofins reference	1045841

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✓	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Please note: Sample has been forwarded to ALS as requested. Additional jar and bag sample labelled "PEN-BH6 0.0-0.1" was receieved by laboratory, sample has been placed on hold.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Zoe Flynn on phone : or by email: ZoeFlynn@eurofins.com

Results will be delivered electronically via email to Dawit Bekele - Dawit.Bekele@douglaspartners.com.au.

Note: A copy of these results will also be delivered to the general Douglas Partners (Qld) Pty Ltd email address.

Douglas Partners Pty Ltd
439 Montague Road
West End
QLD 4101

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Dawit Bekele**

Report **1045841-S**
Project name COPPERSTRING 2.0 PROJECT- PENTLAND
Project ID 200446.02
Received Date Nov 16, 2023

Client Sample ID			**PEN-BH1/0.0-0.2**	**PEN-BH2/0.0-0.2**	**PEN-BH3/0.3-0.5**	**PEN-BH4/0.0-0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-No0048300**	**B23-No0048301**	**B23-No0048302**	**B23-No0048303**
Date Sampled			**Nov 03, 2023**	**Nov 03, 2023**	**Nov 03, 2023**	**Nov 03, 2023**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	116	63	105	131
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			PEN-BH1/0.0-0.2	PEN-BH2/0.0-0.2	PEN-BH3/0.3-0.5	PEN-BH4/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048300	B23-No0048301	B23-No0048302	B23-No0048303
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	63	88	91	95
p-Terphenyl-d14 (surr.)	1	%	78	57	61	115
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	96	75	65	126
Tetrachloro-m-xylene (surr.)	1	%	53	79	53	84
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			PEN-BH1/0.0-0.2	PEN-BH2/0.0-0.2	PEN-BH3/0.3-0.5	PEN-BH4/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048300	B23-No0048301	B23-No0048302	B23-No0048303
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	90	50	71	141
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	96	75	65	126
Tetrachloro-m-xylene (surr.)	1	%	53	79	53	84
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1

Client Sample ID			PEN-BH1/0.0-0.2	PEN-BH2/0.0-0.2	PEN-BH3/0.3-0.5	PEN-BH4/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048300	B23-No0048301	B23-No0048302	B23-No0048303
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Nitrophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	55	63	51	118
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.5	5.9	2.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	18	39	39	13
Copper	5	mg/kg	< 5	6.9	< 5	< 5
Lead	5	mg/kg	5.0	9.3	10	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	8.9	< 5	< 5
Zinc	5	mg/kg	7.4	18	6.0	< 5
Sample Properties						
% Moisture	1	%	< 1	1.8	< 1	< 1

Client Sample ID			PEN-BH5/0.0-0.2	PEN-BH7/0.1-0.2	PEN-BH8/1.3-1.4	PEN-BH9/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048304	B23-No0048306	B23-No0048307	B23-No0048308
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	22
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			PEN-BH5/0.0-0.2	PEN-BH7/0.1-0.2	PEN-BH8/1.3-1.4	PEN-BH9/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048304	B23-No0048306	B23-No0048307	B23-No0048308
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit				
BTEX						
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	92	117	142	91
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	82	62	68	86
p-Terphenyl-d14 (surr.)	1	%	63	79	57	135
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			PEN-BH5/0.0-0.2	PEN-BH7/0.1-0.2	PEN-BH8/1.3-1.4	PEN-BH9/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048304	B23-No0048306	B23-No0048307	B23-No0048308
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	72	61	78	108
Tetrachloro-m-xylene (surr.)	1	%	70	70	92	122
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	81	63	99	116

Client Sample ID			PEN-BH5/0.0-0.2	PEN-BH7/0.1-0.2	PEN-BH8/1.3-1.4	PEN-BH9/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048304	B23-No0048306	B23-No0048307	B23-No0048308
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	72	61	78	108
Tetrachloro-m-xylene (surr.)	1	%	70	70	92	122
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Nitrophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	51	79	83	120
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	6.9	< 2	5.6	5.5
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	40	5.6	57	110
Copper	5	mg/kg	6.3	< 5	17	10
Lead	5	mg/kg	8.4	< 5	10	11
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	22	12
Zinc	5	mg/kg	< 5	< 5	43	11

Client Sample ID			PEN-BH5/0.0-0.2	PEN-BH7/0.1-0.2	PEN-BH8/1.3-1.4	PEN-BH9/0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-No0048304	B23-No0048306	B23-No0048307	B23-No0048308
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	1.7	1.8	4.3	1.8
Crystalline Silica			See Attached	-	-	-

Client Sample ID			PEN-BH10/0.0-0.2	TRIP BLANK	R20TRIP SPIKE	PEN-BH11/0.0-0.2
Sample Matrix			Soil	Trip Blank (solid)	Trip Spike (solid)	Soil
Eurofins Sample No.			B23-No0048309	B23-No0048310	B23-No0048311	B23-No0048312
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	-	< 20
TRH C10-C14	20	mg/kg	< 20	-	-	< 20
TRH C15-C28	50	mg/kg	< 50	-	-	< 50
TRH C29-C36	50	mg/kg	< 50	-	-	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	-	-	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	141	101	-	79
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	-	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	-	< 50
TRH C6-C10	20	mg/kg	< 20	-	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	-	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-	1.2
Acenaphthene	0.5	mg/kg	< 0.5	-	-	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	-	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	-	-	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-	< 0.5

Client Sample ID			PEN-BH10/0.0-0.2	TRIP BLANK	[R20]TRIP SPIKE	PEN-BH11/0.0-0.2
Sample Matrix			Soil	Trip Blank (solid)	Trip Spike (solid)	Soil
Eurofins Sample No.			B23-No0048309	B23-No0048310	B23-No0048311	B23-No0048312
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	-	-	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	-	< 0.5
Pyrene	0.5	mg/kg	< 0.5	-	-	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	-	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	75	-	-	84
p-Terphenyl-d14 (surr.)	1	%	52	-	-	105
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	< 0.05
a-HCH	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
b-HCH	0.05	mg/kg	< 0.05	-	-	< 0.05
d-HCH	0.05	mg/kg	< 0.05	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	-	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	94	-	-	100
Tetrachloro-m-xylene (surr.)	1	%	84	-	-	100
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Bolstar	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Coumaphos	2	mg/kg	< 2	-	-	< 2
Demeton-S	0.2	mg/kg	< 0.2	-	-	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	-	-	< 0.2
Diazinon	0.2	mg/kg	< 0.2	-	-	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	-	-	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	-	-	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	-	-	< 0.2

Client Sample ID			PEN-BH10/0.0-0.2	TRIP BLANK	[R20]TRIP SPIKE	PEN-BH11/0.0-0.2
Sample Matrix			Soil	Trip Blank (solid)	Trip Spike (solid)	Soil
Eurofins Sample No.			B23-No0048309	B23-No0048310	B23-No0048311	B23-No0048312
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
EPN	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethion	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Malathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Merphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Monocrotophos	2	mg/kg	< 2	-	-	< 2
Naled	0.2	mg/kg	< 0.2	-	-	< 0.2
Omethoate	2	mg/kg	< 2	-	-	< 2
Phorate	0.2	mg/kg	< 0.2	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	-	-	< 0.2
Ronnel	0.2	mg/kg	< 0.2	-	-	< 0.2
Terbufos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	60	-	-	89
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	-	-	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	94	-	-	100
Tetrachloro-m-xylene (surr.)	1	%	84	-	-	100
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	-	< 1
Pentachlorophenol	1	mg/kg	< 1	-	-	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	-	-	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	< 1

Client Sample ID			PEN-BH10/0.0-0.2	TRIP BLANK	[R20]TRIP SPIKE	PEN-BH11/0.0-0.2
Sample Matrix			Soil	Trip Blank (solid)	Trip Spike (solid)	Soil
Eurofins Sample No.			B23-No0048309	B23-No0048310	B23-No0048311	B23-No0048312
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-	< 5
2-Nitrophenol	1.0	mg/kg	< 1	-	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	-	-	< 0.5
4-Nitrophenol	5	mg/kg	< 5	-	-	< 5
Dinoseb	20	mg/kg	< 20	-	-	< 20
Phenol	0.5	mg/kg	< 0.5	-	-	< 0.5
Phenol-d6 (surr.)	1	%	50	-	-	103
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	-	-	< 50
TRH >C16-C34	100	mg/kg	< 100	-	-	< 100
TRH >C34-C40	100	mg/kg	< 100	-	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	-	< 100
Heavy Metals						
Arsenic	2	mg/kg	< 2	-	-	4.3
Cadmium	0.4	mg/kg	< 0.4	-	-	< 0.4
Chromium	5	mg/kg	16	-	-	51
Copper	5	mg/kg	< 5	-	-	18
Lead	5	mg/kg	< 5	-	-	21
Mercury	0.1	mg/kg	< 0.1	-	-	< 0.1
Nickel	5	mg/kg	< 5	-	-	20
Zinc	5	mg/kg	5.9	-	-	23
Sample Properties						
% Moisture	1	%	14	-	-	7.1
Crystalline Silica			-	-	-	See Attached
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	-
Naphthalene	1	%	-	-	62	-
TRH C6-C10	1	%	-	-	96	-
TRH C6-C9	1	%	-	-	98	-
Total Recoverable Hydrocarbons						
TRH C6-C10	20	mg/kg	-	< 20	-	-
BTEX						
Benzene	1	%	-	-	75	-
Ethylbenzene	1	%	-	-	70	-
m&p-Xylenes	1	%	-	-	65	-
o-Xylene	1	%	-	-	76	-
Toluene	1	%	-	-	68	-
Xylenes - Total	1	%	-	-	71	-
4-Bromofluorobenzene (surr.)	1	%	-	-	108	-

Client Sample ID			PEN-BH12/0.0-0.2	R2	EN-BH6/0.0-0.2
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			B23-No0048313	B23-No0048314	B23-No0048361
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50
BTEX					
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	75	58	126
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	90	78	53
p-Terphenyl-d14 (surr.)	1	%	104	75	85
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05
a-HCH	0.05	mg/kg	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05

Client Sample ID			PEN-BH12/0.0-0.2	R2	EN-BH6/0.0-0.2
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			B23-No0048313	B23-No0048314	B23-No0048361
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit			
Organochlorine Pesticides					
b-HCH	0.05	mg/kg	< 0.05	-	< 0.05
d-HCH	0.05	mg/kg	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	-	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	94	-	53
Tetrachloro-m-xylene (surr.)	1	%	105	-	72
Organophosphorus Pesticides					
Azinphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2
Bolstar	0.2	mg/kg	< 0.2	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	< 0.2
Coumaphos	2	mg/kg	< 2	-	< 2
Demeton-S	0.2	mg/kg	< 0.2	-	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	-	< 0.2
Diazinon	0.2	mg/kg	< 0.2	-	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	-	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	-	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	-	< 0.2
EPN	0.2	mg/kg	< 0.2	-	< 0.2
Ethion	0.2	mg/kg	< 0.2	-	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	-	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	-	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	-	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	-	< 0.2
Fenthion	0.2	mg/kg	< 0.2	-	< 0.2
Malathion	0.2	mg/kg	< 0.2	-	< 0.2
Merphos	0.2	mg/kg	< 0.2	-	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	-	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	-	< 0.2
Monocrotophos	2	mg/kg	< 2	-	< 2
Naled	0.2	mg/kg	< 0.2	-	< 0.2
Omethoate	2	mg/kg	< 2	-	< 2

Client Sample ID			PEN-BH12/0.0-0.2	R2	EN-BH6/0.0-0.2
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			B23-No0048313	B23-No0048314	B23-No0048361
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit			
Organophosphorus Pesticides					
Phorate	0.2	mg/kg	< 0.2	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	-	< 0.2
Ronnel	0.2	mg/kg	< 0.2	-	< 0.2
Terbufos	0.2	mg/kg	< 0.2	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	-	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	-	< 0.2
Triphenylphosphate (surr.)	1	%	86	-	51
Polychlorinated Biphenyls					
Aroclor-1016	0.1	mg/kg	< 0.1	-	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	-	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	-	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	-	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	-	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	-	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	94	-	53
Tetrachloro-m-xylene (surr.)	1	%	105	-	72
Phenols (Halogenated)					
2-Chlorophenol	0.5	mg/kg	< 0.5	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	< 1
Pentachlorophenol	1	mg/kg	< 1	-	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	-	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	-	< 1
Phenols (non-Halogenated)					
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	< 5
2-Nitrophenol	1.0	mg/kg	< 1	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	-	< 0.5
4-Nitrophenol	5	mg/kg	< 5	-	< 5
Dinoseb	20	mg/kg	< 20	-	< 20
Phenol	0.5	mg/kg	< 0.5	-	< 0.5
Phenol-d6 (surr.)	1	%	114	-	33
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100

Client Sample ID			PEN-BH12/0.0-0.2	R2	EN-BH6/0.0-0.2
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			B23-No0048313	B23-No0048314	B23-No0048361
Date Sampled			Nov 03, 2023	Nov 03, 2023	Nov 03, 2023
Test/Reference	LOR	Unit			
Heavy Metals					
Arsenic	2	mg/kg	3.3	7.1	6.3
Cadmium	0.4	mg/kg	< 0.4	< 0.5	< 0.4
Chromium	5	mg/kg	37	76	59
Copper	5	mg/kg	14	17	12
Lead	5	mg/kg	14	11	17
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	12	9.4	10
Zinc	5	mg/kg	14	54	11
Sample Properties					
% Moisture	1	%	14	5.5	< 1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
- Method: USEPA SW846 8260			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Naphthalene	Melbourne	Nov 22, 2023	
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
- Method: USEPA 8260B - MGT 350A Volatile Organics by GCMS			
Total Recoverable Hydrocarbons	Brisbane	Nov 22, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Eurofins Suite B7A			
Polycyclic Aromatic Hydrocarbons	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Melbourne	Nov 22, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B15			
Organochlorine Pesticides	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)			
Organophosphorus Pesticides	Melbourne	Nov 22, 2023	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8270)			
Polychlorinated Biphenyls	Melbourne	Nov 22, 2023	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)			
% Moisture	Melbourne	Nov 20, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Crystalline Silica	Melbourne	Nov 20, 2023	10 Days
- Method:			

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
West End
QLD 4101

Order No.:
Report #: 1045841
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Nov 16, 2023 11:05 AM
Due: Nov 23, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 2.0 PROJECT- PENTLAND
Project ID: 200446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X	X
External Laboratory						X								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	PEN-BH1/0.0-0.2	Nov 03, 2023		Soil	B23-No0048300			X	X			X		
2	PEN-BH2/0.0-0.2	Nov 03, 2023		Soil	B23-No0048301			X	X			X		
3	PEN-BH3/0.3-0.5	Nov 03, 2023		Soil	B23-No0048302			X	X			X		
4	PEN-BH4/0.0-0.2	Nov 03, 2023		Soil	B23-No0048303			X	X			X		
5	PEN-BH5/0.0-0.2	Nov 03, 2023		Soil	B23-No0048304	X		X	X			X		
6	PEN-BH6/0.0-0.1	Nov 03, 2023		Soil	B23-No0048305		X							
7	PEN-BH7/0.1-0.2	Nov 03, 2023		Soil	B23-No0048306			X	X			X		

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Eurofins Environment Testing Australia Pty Ltd
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Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
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QLD 4101

Order No.:
Report #: 1045841
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Nov 16, 2023 11:05 AM
Due: Nov 23, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 2.0 PROJECT- PENTLAND
Project ID: 200446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X	X
8	PEN-BH8/1.3-1.4	Nov 03, 2023		Soil	B23-No0048307			X	X			X		
9	PEN-BH9/0.0-0.2	Nov 03, 2023		Soil	B23-No0048308			X	X			X		
10	PEN-BH10/0.0-0.2	Nov 03, 2023		Soil	B23-No0048309			X	X			X		
11	TRIP BLANK	Nov 03, 2023		Trip Blank (solid)	B23-No0048310								X	
12	TRIP SPIKE	Nov 03, 2023		Trip Spike (solid)	B23-No0048311									X
13	PEN-BH11/0.0-0.2	Nov 03, 2023		Soil	B23-No0048312	X		X	X			X		
14	PEN-BH12/0.0-0.2	Nov 03, 2023		Soil	B23-No0048313			X	X			X		
15	R2	Nov 03, 2023		Soil	B23-No0048314					X	X			
16	PEN-BH1/0.3-0.5	Nov 03, 2023		Soil	B23-No0048315		X							

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Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X	X
17	PEN-BH1/0.8-1.0	Nov 03, 2023		Soil	B23-No0048316		X							
18	PEN-BH1/1.3-1.5	Nov 03, 2023		Soil	B23-No0048317		X							
19	PEN-BH2/0.3-0.5	Nov 03, 2023		Soil	B23-No0048318		X							
20	PEN-BH2/0.8-1.0	Nov 03, 2023		Soil	B23-No0048319		X							
21	PEN-BH2/1.3-1.5	Nov 03, 2023		Soil	B23-No0048320		X							
22	PEN-BH3/0.0-0.2	Nov 03, 2023		Soil	B23-No0048321		X							
23	PEN-BH3/0.8-1.0	Nov 03, 2023		Soil	B23-No0048322		X							
24	PEN-BH3/1.3-1.5	Nov 03, 2023		Soil	B23-No0048323		X							
25	PEN-BH4/0.3-0.5	Nov 03, 2023		Soil	B23-No0048324		X							

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Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X	X
26	PEN-BH4/0.8-1.0	Nov 03, 2023		Soil	B23-No0048325		X							
27	PEN-BH4/1.3-1.5	Nov 03, 2023		Soil	B23-No0048326		X							
28	PEN-BH5/0.3-0.5	Nov 03, 2023		Soil	B23-No0048327		X							
29	PEN-BH5/0.8-1.0	Nov 03, 2023		Soil	B23-No0048328		X							
30	PEN-BH5/1.3-1.5	Nov 03, 2023		Soil	B23-No0048329		X							
31	PEN-BH6/0.3-0.5	Nov 03, 2023		Soil	B23-No0048330		X							
32	PEN-BH6/0.8-1.0	Nov 03, 2023		Soil	B23-No0048331		X							
33	PEN-BH6/1.3-1.5	Nov 03, 2023		Soil	B23-No0048332		X							
34	PEN-BH7/0.0-0.1	Nov 03, 2023		Soil	B23-No0048333		X							

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Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X	X
35	PEN-BH8/0.0-0.2	Nov 03, 2023		Soil	B23-No0048334		X							
36	PEN-BH8/0.3-0.5	Nov 03, 2023		Soil	B23-No0048335		X							
37	PEN-BH8/0.8-1.0	Nov 03, 2023		Soil	B23-No0048336		X							
38	PEN-BH9/0.3-0.5	Nov 03, 2023		Soil	B23-No0048337		X							
39	PEN-BH9/0.8-1.0	Nov 03, 2023		Soil	B23-No0048338		X							
40	PEN-BH9/1.3-1.5	Nov 03, 2023		Soil	B23-No0048339		X							
41	PEN-BH10/0.3-0.5	Nov 03, 2023		Soil	B23-No0048340		X							
42	PEN-BH10/0.8-1.0	Nov 03, 2023		Soil	B23-No0048341		X							
43	PEN-BH10/1.3-1.5	Nov 03, 2023		Soil	B23-No0048342		X							

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Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X	X	X	X	X
44	PEN-BH11/0.3-0.5	Nov 03, 2023		Soil	B23-No0048343		X							
45	PEN-BH11/0.8-1.0	Nov 03, 2023		Soil	B23-No0048344		X							
46	PEN-BH11/1.3-1.5	Nov 03, 2023		Soil	B23-No0048345		X							
47	PEN-BH12/0.3-0.5	Nov 03, 2023		Soil	B23-No0048346		X							
48	PEN-BH12/0.8-1.0	Nov 03, 2023		Soil	B23-No0048347		X							
49	PEN-BH12/1.3-1.5	Nov 03, 2023		Soil	B23-No0048348		X							
50	EN-BH6/0.0-0.2	Nov 03, 2023		Soil	B23-No0048361			X	X			X		
Test Counts						2	35	12	13	13	1	12	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit	**Colour:** Pt-Co Units	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 10			10	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C10	mg/kg	< 20			20	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	105			70-130	Pass	
TRH C10-C14	%	129			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	86			70-130	Pass	
Toluene	%	90			70-130	Pass	
Ethylbenzene	%	95			70-130	Pass	
m&p-Xylenes	%	102			70-130	Pass	
Xylenes - Total*	%	101			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Naphthalene	%	112			70-130	Pass	
TRH C6-C10	%	94			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	105			70-130	Pass	
Acenaphthylene	%	113			70-130	Pass	
Anthracene	%	100			70-130	Pass	
Benz(a)anthracene	%	99			70-130	Pass	
Benzo(a)pyrene	%	105			70-130	Pass	
Benzo(b&j)fluoranthene	%	115			70-130	Pass	
Benzo(g.h.i)perylene	%	91			70-130	Pass	
Benzo(k)fluoranthene	%	77			70-130	Pass	
Chrysene	%	106			70-130	Pass	
Dibenz(a.h)anthracene	%	86			70-130	Pass	
Fluoranthene	%	92			70-130	Pass	
Fluorene	%	98			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	84			70-130	Pass	
Naphthalene	%	107			70-130	Pass	
Phenanthrene	%	79			70-130	Pass	
Pyrene	%	88			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	98			70-130	Pass	
4.4'-DDD	%	94			70-130	Pass	
4.4'-DDE	%	98			70-130	Pass	
4.4'-DDT	%	82			70-130	Pass	
a-HCH	%	101			70-130	Pass	
Aldrin	%	91			70-130	Pass	
b-HCH	%	116			70-130	Pass	
d-HCH	%	99			70-130	Pass	
Dieldrin	%	71			70-130	Pass	
Endosulfan I	%	121			70-130	Pass	
Endosulfan II	%	95			70-130	Pass	
Endosulfan sulphate	%	94			70-130	Pass	
Endrin	%	93			70-130	Pass	
Endrin aldehyde	%	83			70-130	Pass	
Endrin ketone	%	106			70-130	Pass	
g-HCH (Lindane)	%	81			70-130	Pass	
Heptachlor	%	99			70-130	Pass	
Heptachlor epoxide	%	98			70-130	Pass	
Hexachlorobenzene	%	105			70-130	Pass	
Methoxychlor	%	110			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	112			70-130	Pass	
Dimethoate	%	77			70-130	Pass	
Ethion	%	91			70-130	Pass	
Fenitrothion	%	76			70-130	Pass	
Methyl parathion	%	72			70-130	Pass	
Mevinphos	%	79			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	113			70-130	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenols (Halogenated)							
2-Chlorophenol	%	95			25-140	Pass	
2.4-Dichlorophenol	%	39			25-140	Pass	
2.4.5-Trichlorophenol	%	44			25-140	Pass	
2.4.6-Trichlorophenol	%	90			25-140	Pass	
2.6-Dichlorophenol	%	37			25-140	Pass	
4-Chloro-3-methylphenol	%	64			25-140	Pass	
Pentachlorophenol	%	75			25-140	Pass	
Tetrachlorophenols - Total	%	58			25-140	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	112			25-140	Pass	
2-Methyl-4.6-dinitrophenol	%	88			25-140	Pass	
2-Nitrophenol	%	51			25-140	Pass	
2.4-Dimethylphenol	%	40			25-140	Pass	
2.4-Dinitrophenol	%	117			25-140	Pass	
2-Methylphenol (o-Cresol)	%	62			25-140	Pass	
3&4-Methylphenol (m&p-Cresol)	%	92			25-140	Pass	
4-Nitrophenol	%	95			25-140	Pass	
Dinoseb	%	44			25-140	Pass	
Phenol	%	94			25-140	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	126			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	102			80-120	Pass	
Cadmium	%	97			80-120	Pass	
Chromium	%	108			80-120	Pass	
Copper	%	107			80-120	Pass	
Lead	%	106			80-120	Pass	
Mercury	%	100			80-120	Pass	
Nickel	%	108			80-120	Pass	
Zinc	%	104			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M23-No0051734	NCP	%	110			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M23-No0048822	NCP	%	96			70-130	Pass	
Acenaphthylene	M23-No0048822	NCP	%	98			70-130	Pass	
Anthracene	M23-No0048822	NCP	%	90			70-130	Pass	
Benz(a)anthracene	M23-No0048822	NCP	%	104			70-130	Pass	
Benzo(a)pyrene	M23-No0048822	NCP	%	105			70-130	Pass	
Benzo(b&j)fluoranthene	M23-No0048822	NCP	%	83			70-130	Pass	
Benzo(g.h.i)perylene	M23-No0048822	NCP	%	121			70-130	Pass	
Benzo(k)fluoranthene	M23-No0048822	NCP	%	77			70-130	Pass	
Chrysene	M23-No0048822	NCP	%	112			70-130	Pass	
Dibenz(a.h)anthracene	M23-No0048822	NCP	%	102			70-130	Pass	
Fluoranthene	M23-No0048822	NCP	%	85			70-130	Pass	
Fluorene	M23-No0048822	NCP	%	83			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M23-No0048822	NCP	%	99			70-130	Pass	
Naphthalene	M23-No0048822	NCP	%	100			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenanthrene	M23-No0048822	NCP	%	118			70-130	Pass	
Pyrene	M23-No0048822	NCP	%	71			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M23-No0051306	NCP	%	107			70-130	Pass	
4.4'-DDD	M23-No0051306	NCP	%	102			70-130	Pass	
4.4'-DDE	M23-No0051306	NCP	%	116			70-130	Pass	
4.4'-DDT	M23-No0051306	NCP	%	81			70-130	Pass	
a-HCH	M23-No0051306	NCP	%	83			70-130	Pass	
Aldrin	M23-No0051306	NCP	%	95			70-130	Pass	
b-HCH	M23-No0051306	NCP	%	94			70-130	Pass	
d-HCH	M23-No0051306	NCP	%	71			70-130	Pass	
Dieldrin	M23-No0051306	NCP	%	79			70-130	Pass	
Endosulfan I	M23-No0051306	NCP	%	100			70-130	Pass	
Endosulfan II	M23-No0051306	NCP	%	127			70-130	Pass	
Endosulfan sulphate	M23-No0051306	NCP	%	71			70-130	Pass	
Endrin	M23-No0051306	NCP	%	100			70-130	Pass	
Endrin aldehyde	M23-No0051306	NCP	%	81			70-130	Pass	
Endrin ketone	M23-No0051306	NCP	%	95			70-130	Pass	
g-HCH (Lindane)	M23-No0051306	NCP	%	98			70-130	Pass	
Heptachlor	M23-No0051306	NCP	%	92			70-130	Pass	
Heptachlor epoxide	M23-No0051306	NCP	%	121			70-130	Pass	
Hexachlorobenzene	M23-No0051306	NCP	%	106			70-130	Pass	
Methoxychlor	M23-No0051306	NCP	%	119			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M23-No0048822	NCP	%	94			30-130	Pass	
2.4-Dichlorophenol	M23-No0048822	NCP	%	35			30-130	Pass	
2.4.5-Trichlorophenol	M23-No0048822	NCP	%	105			30-130	Pass	
2.4.6-Trichlorophenol	M23-No0052480	NCP	%	35			30-130	Pass	
2.6-Dichlorophenol	M23-No0048822	NCP	%	36			30-130	Pass	
4-Chloro-3-methylphenol	M23-No0048822	NCP	%	49			30-130	Pass	
Pentachlorophenol	M23-No0052480	NCP	%	129			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M23-No0048822	NCP	%	98			30-130	Pass	
2-Nitrophenol	M23-No0048822	NCP	%	47			30-130	Pass	
2.4-Dimethylphenol	M23-No0048822	NCP	%	76			30-130	Pass	
2-Methylphenol (o-Cresol)	M23-No0048822	NCP	%	68			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M23-No0048822	NCP	%	95			30-130	Pass	
Dinoseb	M23-No0048822	NCP	%	97			30-130	Pass	
Phenol	M23-No0048822	NCP	%	88			30-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M23-No0051734	NCP	%	107			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	B23-No0048301	CP	%	72			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	B23-No0048301	CP	%	117			70-130	Pass	
Toluene	B23-No0048301	CP	%	70			70-130	Pass	
Ethylbenzene	B23-No0048301	CP	%	74			70-130	Pass	
m&p-Xylenes	B23-No0048301	CP	%	82			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
o-Xylene	B23-No0048301	CP	%	79			70-130	Pass	
Xylenes - Total*	B23-No0048301	CP	%	81			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	B23-No0048301	CP	%	98			70-130	Pass	
TRH C6-C10	B23-No0048301	CP	%	71			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	M23-No0044385	NCP	%	78			70-130	Pass	
Aroclor-1260	M23-No0044385	NCP	%	82			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
Tetrachlorophenols - Total	M23-No0052304	NCP	%	50			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Methyl-4.6-dinitrophenol	M23-No0048538	NCP	%	35			30-130	Pass	
2.4-Dinitrophenol	M23-No0048538	NCP	%	35			30-130	Pass	
4-Nitrophenol	M23-No0052304	NCP	%	33			30-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	B23-No0048301	CP	%	101			75-125	Pass	
Cadmium	B23-No0048301	CP	%	103			75-125	Pass	
Chromium	B23-No0048301	CP	%	86			75-125	Pass	
Copper	B23-No0048301	CP	%	107			75-125	Pass	
Lead	B23-No0048301	CP	%	106			75-125	Pass	
Mercury	B23-No0048301	CP	%	102			75-125	Pass	
Nickel	B23-No0048301	CP	%	108			75-125	Pass	
Zinc	B23-No0048301	CP	%	111			75-125	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	B23-No0048361	CP	%	117			70-130	Pass	
Dimethoate	B23-No0048361	CP	%	83			70-130	Pass	
Ethion	B23-No0048361	CP	%	95			70-130	Pass	
Fenitrothion	B23-No0048361	CP	%	95			70-130	Pass	
Methyl parathion	B23-No0048361	CP	%	85			70-130	Pass	
Mevinphos	B23-No0048361	CP	%	103			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B23-No0048300	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	B23-No0048300	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	B23-No0048300	CP	mg/kg	18	17	8.6	30%	Pass	
Copper	B23-No0048300	CP	mg/kg	< 5	5.2	9.7	30%	Pass	
Lead	B23-No0048300	CP	mg/kg	5.0	6.2	22	30%	Pass	
Mercury	B23-No0048300	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	B23-No0048300	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	B23-No0048300	CP	mg/kg	7.4	8.1	9.1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B23-No0048301	CP	mg/kg	2.5	2.4	3.1	30%	Pass	
Cadmium	B23-No0048301	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	B23-No0048301	CP	mg/kg	39	38	1.7	30%	Pass	
Copper	B23-No0048301	CP	mg/kg	6.9	6.7	2.9	30%	Pass	
Lead	B23-No0048301	CP	mg/kg	9.3	9.0	2.9	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Mercury	B23-No0048301	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	B23-No0048301	CP	mg/kg	8.9	8.6	2.8	30%	Pass	
Zinc	B23-No0048301	CP	mg/kg	18	18	2.4	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B23-No0048303	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	B23-No0048303	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	B23-No0048303	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B23-No0048303	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B23-No0048303	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B23-No0048303	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B23-No0048303	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	B23-No0048303	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	B23-No0048303	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B23-No0048303	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B23-No0048303	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(a)pyrene	B23-No0048303	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	B23-No0048303	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	B23-No0048303	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	B23-No0048303	CP	mg/kg	< 2	< 2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Demeton-S	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	B23-No0048303	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	B23-No0048303	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	B23-No0048303	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	B23-No0048303	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	B23-No0048303	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	B23-No0048303	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	B23-No0048303	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	B23-No0048303	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	B23-No0048303	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	B23-No0048303	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	B23-No0048303	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B23-No0048303	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B23-No0048303	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B23-No0048303	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	B23-No0048308	CP	mg/kg	22	< 20	94	30%	Fail	Q15
TRH C15-C28	B23-No0048308	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B23-No0048308	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(a)pyrene	B23-No0048308	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	B23-No0048308	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	B23-No0048308	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	B23-No0048308	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	B23-No0048308	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	B23-No0048308	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Tokuthion	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	B23-No0048308	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	B23-No0048308	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	B23-No0048308	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	B23-No0048308	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	B23-No0048308	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	B23-No0048308	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	B23-No0048308	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	B23-No0048308	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	B23-No0048308	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B23-No0048308	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B23-No0048308	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B23-No0048308	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	B23-No0048308	CP	%	1.8	1.7	6.3	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	B23-No0048313	CP	%	14	14	<1	30%	Pass	

Comments

Analysis of Crystalline Silica has been completed by Agon Environmental, report reference JL4827-19.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised by:

Paige Howarth	Analytical Services Manager
Edward Lee	Senior Analyst-Organic
Emily Rosenberg	Senior Analyst-Metal
Harry Bacalis	Senior Analyst-Volatile
Jonathon Angell	Senior Analyst-Metal
Jonathon Angell	Senior Analyst-Organic
Jonathon Angell	Senior Analyst-Sample Properties
Jonathon Angell	Senior Analyst-Volatile
Joseph Edouard	Senior Analyst-Organic
Mary Makarios	Senior Analyst-Metal
Mary Makarios	Senior Analyst-Sample Properties



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Tyrone Gowans

From: Zoe Flynn
Sent: Wednesday, 29 November 2023 1:38 PM
To: #AU_CAU001_EnviroSampleVic
Subject: FW: Eurofins Test Results_Cr+6
Attachments: 1039930-S_report.pdf; 1045841_summary.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: ADDITIONALS

INFO: INTERNAL EMAIL - Sent from your own Eurofins email domain.

Could you please organise a hexavalent chromium analysis on samples – 5 Day TAT

'PEN-B9/0.0-0.2 ' from report no. 1045841 (No0048308)

~~'CLO-BH9/0.0-0.1' Report no. 1039930 (Oc0074803)~~

Warm Regards,

Zoe Flynn
Analytical Service Manager - QLD

Office Hours: 9:00am-5:00pm

Eurofins Environment Testing Australia Pty Ltd
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AUSTRALIA
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E-mail: ZoeFlynn@eurofins.com
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35 YEARS TESTING FOR LIFE

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From: Dawit Bekele <Dawit.Bekele@douglaspartners.com.au>
Sent: Wednesday, 29 November 2023 12:21 PM

#1049098
29/11/23
SS

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

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6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
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VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

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NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Asb)	Christchurch	Tauranga
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Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	Douglas Partners (Qld) Pty Ltd
Contact name:	Dawit Bekele
Project name:	COPPERSTRING 2.0 PROJECT- PENTLAND
Project ID:	200446.02
Turnaround time:	5 Day
Date/Time received	Nov 29, 2023 1:38 PM
Eurofins reference	1049098

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
N/A	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Zoe Flynn on phone : or by email: ZoeFlynn@eurofins.com

Results will be delivered electronically via email to Dawit Bekele - Dawit.Bekele@douglaspartners.com.au.

Note: A copy of these results will also be delivered to the general Douglas Partners (Qld) Pty Ltd email address.

Douglas Partners Pty Ltd
439 Montague Road
West End
QLD 4101

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Dawit Bekele**

Report **1049098-S**
Project name COPPERSTRING 2.0 PROJECT- PENTLAND
Project ID 200446.02
Received Date Nov 29, 2023

Client Sample ID			**PEN-BH9/0.0-0.2**	**CLO-BH9/0.0-0.1**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**M23-No0073080**	**M23-No0074289**
Date Sampled			**Nov 03, 2023**	**Nov 03, 2023**
Test/Reference	LOR	Unit		
Chromium (hexavalent)	1	mg/kg	< 1	< 1
Sample Properties				
% Moisture	1	%	4.0	6.7

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chromium (hexavalent)	Melbourne	Nov 30, 2023	28 Days
- Method: LTM-INO-4100 Hexavalent Chromium by Spectrometric detection			
% Moisture	Melbourne	Nov 30, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
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+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Asb)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
West End
QLD 4101

Order No.:
Report #: 1049098
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Nov 29, 2023 1:38 PM
Due: Dec 6, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 2.0 PROJECT- PENTLAND
Project ID: 200446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Chromium (hexavalent)	Moisture Set
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	PEN-BH9/0.0-0.2	Nov 03, 2023		Soil	M23-No0073080	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit	**Colour:** Pt-Co Units	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Chromium (hexavalent)			mg/kg	< 1			1	Pass	
LCS - % Recovery									
Chromium (hexavalent)			%	115			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
				Result 1					
Chromium (hexavalent)	B23-No0071888	NCP	%	111			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	K23-No0057373	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-No0073080	CP	%	4.0	3.0	29	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Zoe Flynn	Analytical Services Manager
Mary Makarios	Senior Analyst-Inorganic



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

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☐ **Perth Laboratory**
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☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Richmond	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter			
Handed over by	Luke Baxter			
Email for Invoice	apinvoices@douglaspartners.com.au			
Email for Results	Dawit.Bekele@douglaspartners.com.au			

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	RIC-BH1/ 0.2	20/10/23	S													
2	RIC-BH1/ 0.5	20/10/23	S	X												
3	RIC-BH1/ / 1.0	20/10/23	S													
4	RIC-BH1/ 1.5	20/10/23	S													
5	RIC-BH2/ 0.2	21/10/23	S	X												
6	RIC-BH2/ 0.5	21/10/23	S													
7	RIC-BH2/ 1.0	21/10/23	S													
8	RIC-BH2/ 1.5	21/10/23	S													
9																
10																
		Total Counts		2												

Date/Time: 27/10/23 10:30am
Chilled: Yes/No
Temp: 15.7 AK
Correction:
Final Temp:

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature	Date	Time	

Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Report №	

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Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter	
Handed over by	Luke Baxter	
Email for Invoice	apinvoices@douglaspartners.com.au	
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☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	RIC-BH3/ 0.2	21/10/23	S	X												
2	RIC-BH3/ 0.5	21/10/23	S													
3	RIC-BH3/ / 1.0	21/10/23	S													
4	RIC-BH3/ 1.5	21/10/23	S													
5	RIC-BH4/ 0.2	20/10/23	S	X												
6	RIC-BH4/ 0.5	20/10/23	S													
7	RIC-BH4/ /1.0	20/10/23	S													
8	RIC-BH4/ 1.5	20/10/23	S													
9																
10																
		Total Counts		2												

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal Name Signature Date Time

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Received By SYD | BNE | MEL | PER | ADL | NTL | DRW Signature Date Time Temperature

Received By SYD | BNE | MEL | PER | ADL | NTL | DRW Signature Date Time Report №

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☐ **Melbourne Laboratory** 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Richmond	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter	
Handed over by	Luke Baxter	
Email for Invoice	apinvoices@douglaspartners.com.au	
Email for Results	Dawit.Bekele@douglaspartners.com.au	

Containers (Change container type & size if necessary.)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked.)

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☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

Analyses Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	RIC-BH5/ 0.2	20/10/23	S	X												
2	RIC-BH5/ 0.5	20/10/23	S													
3	RIC-BH5/ / 1.0	20/10/23	S													
4	RIC-BH5/ 1.5	20/10/23	S													
5	RIC-BH6/ 0.2	20/10/23	S	X												
6	RIC-BH6/ 0.5	20/10/23	S													
7	RIC-BH6/ /1.0	20/10/23	S													
8	RIC-BH6/ 1.5	20/10/23	S													
9																
10																
		Total Counts		2												

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Richmond	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter
Handed over by	Luke Baxter
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Analyses: Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing. Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	Containers: Change container type & size if necessary. 500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	RIC-BH7/ 0.2	21/10/23	S	X		X										
2	RIC-BH7/ 0.5	21/10/23	S													
3	RIC-BH7/ / 1.0	21/10/23	S													
4	RIC-BH7/ 1.5	21/10/23	S													
5	RIC-BH8/ 0.2	21/10/23	S													
6	RIC-BH8/ 0.5	21/10/23	S	X												
7	RIC-BH8/ /1.0	21/10/23	S													
8	RIC-BH8/ 1.5	21/10/23	S													
9																
10																
		Total Counts		2		1										

Required Turnaround Time (TAT) Default will be 5 days if not ticked.

♦Surcharge will apply
- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Richmond	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
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Sampler(s)	Luke Baxter
Handed over by	Luke Baxter
Email for Invoice	apinvoices@douglaspartners.com.au
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Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

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☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	RIC-BH9/ 0.2	21/10/23	S	X												
2	RIC-BH9/ 0.5	21/10/23	S													
3	RIC-BH9/ / 1.0	21/10/23	S													
4	RIC-BH9/ 1.5	21/10/23	S													
5	RIC-BH10/ 0.2	21/10/23	S	X		X										
6	RIC-BH10/ 0.5	21/10/23	S													
7	RIC-BH10/ 1.0	21/10/23	S													
8	RIC-BH10/ 1.5	21/10/23	S													
9																
10																
	Total Counts			2		1										

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	

Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

☐ **Sydney Laboratory**
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☑ **Brisbane Laboratory**
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Richmond	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter
Handed over by	Luke Baxter
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	RIC-BH11/ 0.2	21/10/23	S	✖												
2	RIC-BH11/ 0.5	21/10/23	S													
3	RIC-BH11/ / 1.0	21/10/23	S													
4	RIC-BH11/ 1.5	21/10/23	S													
5	RIC-BH12/ 0.2	21/10/23	S													
6	RIC-BH12/ 0.5	21/10/23	S	✖												
7	RIC-BH12/ 1.0	21/10/23	S													
8	RIC-BH12/ 1.5	21/10/23	S													
9																
10																
	Total Counts			2												

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

☐ **Sydney Laboratory**
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☑ **Brisbane Laboratory**
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - Richmond	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter
Handed over by	Luke Baxter
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	S2	21/10/23	S													Please send this sample to ALS
2	R2	21/10/23	S		X											
3	Trip Blank						X									
4	Trip Blank						X									
5																
6																
7																
8																
9																
10																
	Total Counts				1		2									

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	

Eurofins | mgt Laboratory Use Only											
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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web: www.eurofins.com.au
email: EnviroSales@eurofins.com

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ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

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Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
West End
QLD 4101

Order No.:
Report #: 1039911
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Oct 27, 2023 10:30 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 20 PROJECT- RICHMOND
Project ID: 20445.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254												
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X
External Laboratory						X						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	RIC-BH1/0.5	Oct 20, 2023		Soil	B23-Oc0074631			X	X		X	
2	RIC-BH2/0.2	Oct 21, 2023		Soil	B23-Oc0074632			X	X		X	
3	RIC-BH3/0.2	Oct 21, 2023		Soil	B23-Oc0074633			X	X		X	
4	RIC-BH4/0.2	Oct 20, 2023		Soil	B23-Oc0074634			X	X		X	
5	RIC-BH5/0.2	Oct 20, 2023		Soil	B23-Oc0074635			X	X		X	
6	RIC-BH6/0.2	Oct 20, 2023		Soil	B23-Oc0074636			X	X		X	
7	RIC-BH7/0.2	Oct 21, 2023		Soil	B23-Oc0074637	X		X	X		X	
8	RIC-BH8/0.5	Oct 21, 2023		Soil	B23-Oc0074638			X	X		X	
9	RIC-BH9/0.2	Oct 21, 2023		Soil	B23-Oc0074639			X	X		X	
10	RIC-BH10/0.2	Oct 21, 2023		Soil	B23-Oc0074640	X		X	X		X	
11	RIC-BH11/0.2	Oct 21, 2023		Soil	B23-Oc0074641			X	X		X	

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6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

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Auckland	Christchurch	Tauranga
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Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
West End
QLD 4101

Order No.:
Report #: 1039911
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Oct 27, 2023 10:30 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 20 PROJECT- RICHMOND
Project ID: 20445.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254												
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X
12	RIC-BH12/0.5	Oct 21, 2023		Soil	B23-Oc0074642			X	X		X	
13	R2	Oct 21, 2023		Soil	B23-Oc0074643				X	X		
14	TRIP BLANK	Oct 21, 2023		Trip Blank (solid)	B23-Oc0074644							X
15	RIC-BH1/0.2	Oct 20, 2023		Soil	B23-Oc0074645		X					
16	RIC-BH1/1.0	Oct 20, 2023		Soil	B23-Oc0074646		X					
17	RIC-BH1/1.5	Oct 20, 2023		Soil	B23-Oc0074647		X					
18	RIC-BH2/0.5	Oct 21, 2023		Soil	B23-Oc0074648		X					
19	RIC-BH2/1.0	Oct 21, 2023		Soil	B23-Oc0074649		X					
20	RIC-BH2/1.5	Oct 21, 2023		Soil	B23-Oc0074650		X					
21	RIC-BH3/0.5	Oct 21, 2023		Soil	B23-Oc0074651		X					
22	RIC-BH3/1.0	Oct 21, 2023		Soil	B23-Oc0074652		X					
23	RIC-BH3/1.5	Oct 21, 2023		Soil	B23-Oc0074653		X					
24	RIC-BH4/0.5	Oct 20, 2023		Soil	B23-Oc0074654		X					

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd
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Auckland 1061	Christchurch 7675	Tauranga 3112
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IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
West End
QLD 4101

Order No.:
Report #: 1039911
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Oct 27, 2023 10:30 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 20 PROJECT- RICHMOND
Project ID: 20445.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254												
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X
25	RIC-BH4/1.0	Oct 20, 2023		Soil	B23-Oc0074655		X					
26	RIC-BH4/1.5	Oct 20, 2023		Soil	B23-Oc0074656		X					
27	RIC-BH5/0.5	Oct 20, 2023		Soil	B23-Oc0074657		X					
28	RIC-BH5/1.0	Oct 20, 2023		Soil	B23-Oc0074658		X					
29	RIC-BH5/1.5	Oct 20, 2023		Soil	B23-Oc0074659		X					
30	RIC-BH6/0.5	Oct 20, 2023		Soil	B23-Oc0074660		X					
31	RIC-BH6/1.0	Oct 20, 2023		Soil	B23-Oc0074661		X					
32	RIC-BH6/1.5	Oct 20, 2023		Soil	B23-Oc0074662		X					
33	RIC-BH7/0.5	Oct 21, 2023		Soil	B23-Oc0074663		X					
34	RIC-BH7/1.0	Oct 21, 2023		Soil	B23-Oc0074664		X					
35	RIC-BH7/1.5	Oct 21, 2023		Soil	B23-Oc0074665		X					
36	RIC-BH8/0.2	Oct 21, 2023		Soil	B23-Oc0074666		X					
37	RIC-BH8/1.0	Oct 21, 2023		Soil	B23-Oc0074667		X					
38	RIC-BH8/1.5	Oct 21, 2023		Soil	B23-Oc0074668		X					

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
West End
QLD 4101

Order No.:
Report #: 1039911
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Oct 27, 2023 10:30 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 20 PROJECT- RICHMOND
Project ID: 20445.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254												
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X
39	RIC-BH9/0.5	Oct 21, 2023		Soil	B23-Oc0074669		X					
40	RIC-BH9/1.0	Oct 21, 2023		Soil	B23-Oc0074670		X					
41	RIC-BH9/1.5	Oct 21, 2023		Soil	B23-Oc0074671		X					
42	RIC-BH10/0.5	Oct 21, 2023		Soil	B23-Oc0074672		X					
43	RIC-BH10/1.0	Oct 21, 2023		Soil	B23-Oc0074673		X					
44	RIC-BH10/1.5	Oct 21, 2023		Soil	B23-Oc0074674		X					
45	RIC-BH11/0.5	Oct 21, 2023		Soil	B23-Oc0074675		X					
46	RIC-BH11/1.0	Oct 21, 2023		Soil	B23-Oc0074676		X					
47	RIC-BH11/1.5	Oct 21, 2023		Soil	B23-Oc0074677		X					
48	RIC-BH12/0.2	Oct 21, 2023		Soil	B23-Oc0074678		X					
49	RIC-BH12/1.0	Oct 21, 2023		Soil	B23-Oc0074679		X					
50	RIC-BH12/1.5	Oct 21, 2023		Soil	B23-Oc0074680		X					
Test Counts						2	36	12	13	1	12	1

Douglas Partners Pty Ltd
439 Montague Road
West End
QLD 4101

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Dawit Bekele**

Report **1039911-S**
Project name COPPERSTRING 20 PROJECT- RICHMOND
Project ID 20445.02
Received Date Oct 27, 2023

Client Sample ID			**RIC-BH1/0.5**	**RIC-BH2/0.2**	**RIC-BH3/0.2**	**RIC-BH4/0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0074631**	**B23-Oc0074632**	**B23-Oc0074633**	**B23-Oc0074634**
Date Sampled			**Oct 20, 2023**	**Oct 21, 2023**	**Oct 21, 2023**	**Oct 20, 2023**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	83	107	71	86
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			RIC-BH1/0.5	RIC-BH2/0.2	RIC-BH3/0.2	RIC-BH4/0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0074631	B23-Oc0074632	B23-Oc0074633	B23-Oc0074634
Date Sampled			Oct 20, 2023	Oct 21, 2023	Oct 21, 2023	Oct 20, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	115	106	99	98
p-Terphenyl-d14 (surr.)	1	%	120	117	119	115
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	INT	141	137	124
Tetrachloro-m-xylene (surr.)	1	%	128	114	116	109
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			RIC-BH1/0.5	RIC-BH2/0.2	RIC-BH3/0.2	RIC-BH4/0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0074631	B23-Oc0074632	B23-Oc0074633	B23-Oc0074634
Date Sampled			Oct 20, 2023	Oct 21, 2023	Oct 21, 2023	Oct 20, 2023
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	119	110	114	106
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	INT	141	137	124
Tetrachloro-m-xylene (surr.)	1	%	128	114	116	109
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			RIC-BH1/0.5	RIC-BH2/0.2	RIC-BH3/0.2	RIC-BH4/0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0074631	B23-Oc0074632	B23-Oc0074633	B23-Oc0074634
Date Sampled			Oct 20, 2023	Oct 21, 2023	Oct 21, 2023	Oct 20, 2023
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	103	96	102	98
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	6.5	5.8	3.9	4.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	16	18	18	17
Copper	5	mg/kg	15	20	20	18
Lead	5	mg/kg	8.5	9.6	9.0	9.3
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	17	19	23	17
Zinc	5	mg/kg	53	60	57	54
Sample Properties						
% Moisture	1	%	12	13	24	34

Client Sample ID			RIC-BH5/0.2	RIC-BH6/0.2	RIC-BH7/0.2	RIC-BH8/0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0074635	B23-Oc0074636	B23-Oc0074637	B23-Oc0074638
Date Sampled			Oct 20, 2023	Oct 20, 2023	Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	86	87	104	80

Client Sample ID			RIC-BH5/0.2	RIC-BH6/0.2	RIC-BH7/0.2	RIC-BH8/0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0074635	B23-Oc0074636	B23-Oc0074637	B23-Oc0074638
Date Sampled			Oct 20, 2023	Oct 20, 2023	Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	105	112	111	100
p-Terphenyl-d14 (surr.)	1	%	116	121	120	119
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			RIC-BH5/0.2	RIC-BH6/0.2	RIC-BH7/0.2	RIC-BH8/0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0074635	B23-Oc0074636	B23-Oc0074637	B23-Oc0074638
Date Sampled			Oct 20, 2023	Oct 20, 2023	Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	127	83	96	126
Tetrachloro-m-xylene (surr.)	1	%	113	118	119	111
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	112	88	95	106
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			RIC-BH5/0.2	RIC-BH6/0.2	RIC-BH7/0.2	RIC-BH8/0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0074635	B23-Oc0074636	B23-Oc0074637	B23-Oc0074638
Date Sampled			Oct 20, 2023	Oct 20, 2023	Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	127	83	96	126
Tetrachloro-m-xylene (surr.)	1	%	113	118	119	111
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	107	113	115	109
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	4.6	5.7	5.2	4.2
Cadmium	0.4	mg/kg	< 0.4	0.8	0.8	< 0.4
Chromium	5	mg/kg	20	22	17	20
Copper	5	mg/kg	21	26	20	19
Lead	5	mg/kg	10	11	9.5	10
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	22	24	22	21
Zinc	5	mg/kg	63	81	72	63
Sample Properties						
% Moisture	1	%	12	18	5.3	14
Crystalline Silica			-	-	See Attached	-

Client Sample ID			RIC-BH9/0.2	RIC-BH10/0.2	RIC-BH11/0.2	RIC-BH12/0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0074639	B23-Oc0074640	B23-Oc0074641	B23-Oc0074642
Date Sampled			Oct 21, 2023	Oct 21, 2023	Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	104	108	95	94
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	108	105	102	102
p-Terphenyl-d14 (surr.)	1	%	113	115	117	115
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			RIC-BH9/0.2	RIC-BH10/0.2	RIC-BH11/0.2	RIC-BH12/0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0074639	B23-Oc0074640	B23-Oc0074641	B23-Oc0074642
Date Sampled			Oct 21, 2023	Oct 21, 2023	Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	118	130	124	120
Tetrachloro-m-xylene (surr.)	1	%	111	111	112	110
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			RIC-BH9/0.2	RIC-BH10/0.2	RIC-BH11/0.2	RIC-BH12/0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0074639	B23-Oc0074640	B23-Oc0074641	B23-Oc0074642
Date Sampled			Oct 21, 2023	Oct 21, 2023	Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	109	107	108	114
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	118	130	124	120
Tetrachloro-m-xylene (surr.)	1	%	111	111	112	110
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	105	105	105	96
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100

Client Sample ID			RIC-BH9/0.2	RIC-BH10/0.2	RIC-BH11/0.2	RIC-BH12/0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0074639	B23-Oc0074640	B23-Oc0074641	B23-Oc0074642
Date Sampled			Oct 21, 2023	Oct 21, 2023	Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	4.5	4.6	3.6	20
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	9.9
Chromium	5	mg/kg	18	21	12	26
Copper	5	mg/kg	17	20	11	67
Lead	5	mg/kg	10	10	5.8	9.1
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	18	20	15	62
Zinc	5	mg/kg	54	60	44	280
Sample Properties						
% Moisture	1	%	10	8.9	8.7	14
Crystalline Silica			-	See Attached	-	-

Client Sample ID			R2	TRIP BLANK
Sample Matrix			Soil	Trip Blank (solid)
Eurofins Sample No.			B23-Oc0074643	B23-Oc0074644
Date Sampled			Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	-
TRH C15-C28	50	mg/kg	< 50	-
TRH C29-C36	50	mg/kg	< 50	-
TRH C10-C36 (Total)	50	mg/kg	< 50	-
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	93	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-
TRH C6-C10	20	mg/kg	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-

Client Sample ID			R2	TRIP BLANK
Sample Matrix			Soil	Trip Blank (solid)
Eurofins Sample No.			B23-Oc0074643	B23-Oc0074644
Date Sampled			Oct 21, 2023	Oct 21, 2023
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	92	-
p-Terphenyl-d14 (surr.)	1	%	102	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	50	mg/kg	< 50	-
TRH >C16-C34	100	mg/kg	< 100	-
TRH >C34-C40	100	mg/kg	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-
Heavy Metals				
Arsenic	2	mg/kg	4.4	-
Cadmium	0.5	mg/kg	< 0.5	-
Chromium	5	mg/kg	26	-
Copper	5	mg/kg	18	-
Lead	5	mg/kg	9.5	-
Mercury	0.1	mg/kg	< 0.1	-
Nickel	5	mg/kg	13	-
Zinc	5	mg/kg	61	-
Sample Properties				
% Moisture	1	%	14	-
Naphthalene[N02]	0.5	mg/kg	-	< 0.5
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20
Total Recoverable Hydrocarbons				
TRH C6-C10	20	mg/kg	-	< 20

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Brisbane	Nov 09, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Brisbane	Nov 08, 2023	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
- Method: USEPA SW846 8260			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Brisbane	Nov 08, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Naphthalene	Brisbane	Nov 08, 2023	14 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
- Method: USEPA 8260B - MGT 350A Volatile Organics by GCMS			
Total Recoverable Hydrocarbons	Brisbane	Nov 02, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Brisbane	Nov 08, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Sydney	Nov 02, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Sydney	Nov 02, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Brisbane	Nov 08, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Brisbane	Nov 08, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B15			
Organochlorine Pesticides	Sydney	Nov 03, 2023	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Nov 02, 2023	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Sydney	Nov 02, 2023	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
% Moisture	Brisbane	Oct 31, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Crystalline Silica	Melbourne	Oct 31, 2023	10 Days
- Method:			

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
West End
QLD 4101

Order No.:
Report #: 1039911
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Oct 27, 2023 10:30 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 20 PROJECT- RICHMOND
Project ID: 20445.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail	Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217			X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794		X			X	X	X
External Laboratory	X						

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	RIC-BH1/0.5	Oct 20, 2023		Soil	B23-Oc0074631			X	X		X	
2	RIC-BH2/0.2	Oct 21, 2023		Soil	B23-Oc0074632			X	X		X	
3	RIC-BH3/0.2	Oct 21, 2023		Soil	B23-Oc0074633			X	X		X	
4	RIC-BH4/0.2	Oct 20, 2023		Soil	B23-Oc0074634			X	X		X	
5	RIC-BH5/0.2	Oct 20, 2023		Soil	B23-Oc0074635			X	X		X	
6	RIC-BH6/0.2	Oct 20, 2023		Soil	B23-Oc0074636			X	X		X	
7	RIC-BH7/0.2	Oct 21, 2023		Soil	B23-Oc0074637	X		X	X		X	
8	RIC-BH8/0.5	Oct 21, 2023		Soil	B23-Oc0074638			X	X		X	
9	RIC-BH9/0.2	Oct 21, 2023		Soil	B23-Oc0074639			X	X		X	
10	RIC-BH10/0.2	Oct 21, 2023		Soil	B23-Oc0074640	X		X	X		X	
11	RIC-BH11/0.2	Oct 21, 2023		Soil	B23-Oc0074641			X	X		X	

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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IANZ# 1327	IANZ# 1290	IANZ# 1402

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Order No.:
Report #: 1039911
Phone: 07 3237 8900
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Received: Oct 27, 2023 10:30 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 20 PROJECT- RICHMOND
Project ID: 20445.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254												
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X
12	RIC-BH12/0.5	Oct 21, 2023		Soil	B23-Oc0074642			X	X		X	
13	R2	Oct 21, 2023		Soil	B23-Oc0074643				X	X		
14	TRIP BLANK	Oct 21, 2023		Trip Blank (solid)	B23-Oc0074644							X
15	RIC-BH1/0.2	Oct 20, 2023		Soil	B23-Oc0074645		X					
16	RIC-BH1/1.0	Oct 20, 2023		Soil	B23-Oc0074646		X					
17	RIC-BH1/1.5	Oct 20, 2023		Soil	B23-Oc0074647		X					
18	RIC-BH2/0.5	Oct 21, 2023		Soil	B23-Oc0074648		X					
19	RIC-BH2/1.0	Oct 21, 2023		Soil	B23-Oc0074649		X					
20	RIC-BH2/1.5	Oct 21, 2023		Soil	B23-Oc0074650		X					
21	RIC-BH3/0.5	Oct 21, 2023		Soil	B23-Oc0074651		X					
22	RIC-BH3/1.0	Oct 21, 2023		Soil	B23-Oc0074652		X					
23	RIC-BH3/1.5	Oct 21, 2023		Soil	B23-Oc0074653		X					
24	RIC-BH4/0.5	Oct 20, 2023		Soil	B23-Oc0074654		X					

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Received: Oct 27, 2023 10:30 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 20 PROJECT- RICHMOND
Project ID: 20445.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254												
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X
25	RIC-BH4/1.0	Oct 20, 2023		Soil	B23-Oc0074655		X					
26	RIC-BH4/1.5	Oct 20, 2023		Soil	B23-Oc0074656		X					
27	RIC-BH5/0.5	Oct 20, 2023		Soil	B23-Oc0074657		X					
28	RIC-BH5/1.0	Oct 20, 2023		Soil	B23-Oc0074658		X					
29	RIC-BH5/1.5	Oct 20, 2023		Soil	B23-Oc0074659		X					
30	RIC-BH6/0.5	Oct 20, 2023		Soil	B23-Oc0074660		X					
31	RIC-BH6/1.0	Oct 20, 2023		Soil	B23-Oc0074661		X					
32	RIC-BH6/1.5	Oct 20, 2023		Soil	B23-Oc0074662		X					
33	RIC-BH7/0.5	Oct 21, 2023		Soil	B23-Oc0074663		X					
34	RIC-BH7/1.0	Oct 21, 2023		Soil	B23-Oc0074664		X					
35	RIC-BH7/1.5	Oct 21, 2023		Soil	B23-Oc0074665		X					
36	RIC-BH8/0.2	Oct 21, 2023		Soil	B23-Oc0074666		X					
37	RIC-BH8/1.0	Oct 21, 2023		Soil	B23-Oc0074667		X					
38	RIC-BH8/1.5	Oct 21, 2023		Soil	B23-Oc0074668		X					

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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IANZ# 1327	IANZ# 1290	IANZ# 1402

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Order No.:
Report #: 1039911
Phone: 07 3237 8900
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Received: Oct 27, 2023 10:30 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 20 PROJECT- RICHMOND
Project ID: 20445.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254												
Sydney Laboratory - NATA # 1261 Site # 18217								X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X	X	X
39	RIC-BH9/0.5	Oct 21, 2023		Soil	B23-Oc0074669		X					
40	RIC-BH9/1.0	Oct 21, 2023		Soil	B23-Oc0074670		X					
41	RIC-BH9/1.5	Oct 21, 2023		Soil	B23-Oc0074671		X					
42	RIC-BH10/0.5	Oct 21, 2023		Soil	B23-Oc0074672		X					
43	RIC-BH10/1.0	Oct 21, 2023		Soil	B23-Oc0074673		X					
44	RIC-BH10/1.5	Oct 21, 2023		Soil	B23-Oc0074674		X					
45	RIC-BH11/0.5	Oct 21, 2023		Soil	B23-Oc0074675		X					
46	RIC-BH11/1.0	Oct 21, 2023		Soil	B23-Oc0074676		X					
47	RIC-BH11/1.5	Oct 21, 2023		Soil	B23-Oc0074677		X					
48	RIC-BH12/0.2	Oct 21, 2023		Soil	B23-Oc0074678		X					
49	RIC-BH12/1.0	Oct 21, 2023		Soil	B23-Oc0074679		X					
50	RIC-BH12/1.5	Oct 21, 2023		Soil	B23-Oc0074680		X					
Test Counts						2	36	12	13	1	12	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30%; however the following acceptance guidelines are equally applicable: Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported, have been reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 10			10	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Nitrophenol	mg/kg	< 1			1	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.5	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C10	mg/kg	< 20			20	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	99			70-130	Pass	
TRH C10-C14	%	85			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	116			70-130	Pass	
Toluene	%	107			70-130	Pass	
Ethylbenzene	%	118			70-130	Pass	
m&p-Xylenes	%	123			70-130	Pass	
o-Xylene	%	104			70-130	Pass	
Xylenes - Total*	%	123			70-130	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	73			70-130	Pass	
TRH C6-C10	%	99			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	92			70-130	Pass	
Acenaphthylene	%	72			70-130	Pass	
Anthracene	%	83			70-130	Pass	
Benz(a)anthracene	%	98			70-130	Pass	
Benzo(a)pyrene	%	116			70-130	Pass	
Benzo(b&j)fluoranthene	%	91			70-130	Pass	
Benzo(g.h.i)perylene	%	110			70-130	Pass	
Benzo(k)fluoranthene	%	80			70-130	Pass	
Chrysene	%	128			70-130	Pass	
Dibenz(a.h)anthracene	%	80			70-130	Pass	
Fluoranthene	%	100			70-130	Pass	
Fluorene	%	85			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	73			70-130	Pass	
Naphthalene	%	90			70-130	Pass	
Phenanthrene	%	77			70-130	Pass	
Pyrene	%	83			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	100			70-130	Pass	
4.4'-DDD	%	87			70-130	Pass	
4.4'-DDE	%	93			70-130	Pass	
4.4'-DDT	%	97			70-130	Pass	
a-HCH	%	80			70-130	Pass	
Aldrin	%	82			70-130	Pass	
b-HCH	%	89			70-130	Pass	
d-HCH	%	83			70-130	Pass	
Dieldrin	%	92			70-130	Pass	
Endosulfan I	%	85			70-130	Pass	
Endosulfan II	%	89			70-130	Pass	
Endosulfan sulphate	%	97			70-130	Pass	
Endrin	%	101			70-130	Pass	
Endrin aldehyde	%	81			70-130	Pass	
Endrin ketone	%	91			70-130	Pass	
g-HCH (Lindane)	%	80			70-130	Pass	
Heptachlor	%	94			70-130	Pass	
Heptachlor epoxide	%	92			70-130	Pass	
Hexachlorobenzene	%	87			70-130	Pass	
Methoxychlor	%	82			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	110			70-130	Pass	
Dimethoate	%	81			70-130	Pass	
Ethion	%	98			70-130	Pass	
Fenitrothion	%	74			70-130	Pass	
Methyl parathion	%	96			70-130	Pass	
Mevinphos	%	101			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1016	%	74			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1260	%	77			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	78			25-140	Pass	
2.4-Dichlorophenol	%	88			25-140	Pass	
2.4.6-Trichlorophenol	%	95			25-140	Pass	
2.6-Dichlorophenol	%	88			25-140	Pass	
4-Chloro-3-methylphenol	%	76			25-140	Pass	
Pentachlorophenol	%	74			25-140	Pass	
Tetrachlorophenols - Total	%	78			25-140	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	72			25-140	Pass	
2-Nitrophenol	%	81			25-140	Pass	
2.4-Dimethylphenol	%	80			25-140	Pass	
2-Methylphenol (o-Cresol)	%	81			25-140	Pass	
3&4-Methylphenol (m&p-Cresol)	%	85			25-140	Pass	
4-Nitrophenol	%	71			25-140	Pass	
Dinoseb	%	71			25-140	Pass	
Phenol	%	76			25-140	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	83			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	95			80-120	Pass	
Cadmium	%	96			80-120	Pass	
Chromium	%	120			80-120	Pass	
Copper	%	93			80-120	Pass	
Lead	%	93			80-120	Pass	
Mercury	%	117			80-120	Pass	
Nickel	%	111			80-120	Pass	
Zinc	%	118			80-120	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C10	%	107			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S23-Oc0074310	NCP	%	88			70-130	Pass	
4.4'-DDD	S23-Oc0074310	NCP	%	87			70-130	Pass	
4.4'-DDE	S23-Oc0074310	NCP	%	93			70-130	Pass	
4.4'-DDT	S23-Oc0074310	NCP	%	107			70-130	Pass	
a-HCH	S23-Oc0074310	NCP	%	89			70-130	Pass	
Aldrin	S23-Oc0074310	NCP	%	81			70-130	Pass	
b-HCH	S23-Oc0074310	NCP	%	86			70-130	Pass	
d-HCH	S23-Oc0074310	NCP	%	91			70-130	Pass	
Dieldrin	S23-Oc0074310	NCP	%	91			70-130	Pass	
Endosulfan I	S23-Oc0074310	NCP	%	94			70-130	Pass	
Endosulfan II	S23-Oc0074310	NCP	%	99			70-130	Pass	
Endosulfan sulphate	S23-Oc0074310	NCP	%	95			70-130	Pass	
Endrin	S23-Oc0074310	NCP	%	107			70-130	Pass	
Endrin aldehyde	S23-Oc0074310	NCP	%	77			70-130	Pass	
Endrin ketone	S23-Oc0074310	NCP	%	87			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
g-HCH (Lindane)	S23-Oc0074310	NCP	%	86			70-130	Pass	
Heptachlor	S23-Oc0074310	NCP	%	96			70-130	Pass	
Heptachlor epoxide	S23-Oc0074310	NCP	%	80			70-130	Pass	
Hexachlorobenzene	S23-Oc0074310	NCP	%	85			70-130	Pass	
Methoxychlor	S23-Oc0074310	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S23-Oc0074310	NCP	%	109			70-130	Pass	
Dimethoate	S23-Oc0074310	NCP	%	83			70-130	Pass	
Ethion	S23-Oc0074310	NCP	%	110			70-130	Pass	
Fenitrothion	S23-Oc0074310	NCP	%	84			70-130	Pass	
Methyl parathion	S23-Oc0074310	NCP	%	99			70-130	Pass	
Mevinphos	S23-Oc0074310	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	S23-Oc0074310	NCP	%	77			70-130	Pass	
Aroclor-1260	S23-Oc0074310	NCP	%	74			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	B23-Oc0074633	CP	%	75			75-125	Pass	
Cadmium	B23-Oc0074633	CP	%	82			75-125	Pass	
Chromium	B23-Oc0074633	CP	%	77			75-125	Pass	
Copper	B23-Oc0074633	CP	%	76			75-125	Pass	
Lead	B23-Oc0074633	CP	%	76			75-125	Pass	
Mercury	B23-Oc0074633	CP	%	96			75-125	Pass	
Nickel	B23-Oc0074633	CP	%	76			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	B23-No0019288	NCP	%	102			70-130	Pass	
TRH C10-C14	B23-No0019195	NCP	%	85			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	B23-No0019288	NCP	%	110			70-130	Pass	
Toluene	B23-No0019288	NCP	%	107			70-130	Pass	
Ethylbenzene	B23-No0019288	NCP	%	111			70-130	Pass	
m&p-Xylenes	B23-No0019288	NCP	%	114			70-130	Pass	
o-Xylene	B23-No0019288	NCP	%	115			70-130	Pass	
Xylenes - Total*	B23-No0019288	NCP	%	114			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	B23-No0019288	NCP	%	99			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	B23-No0015647	NCP	%	119			70-130	Pass	
Acenaphthylene	B23-No0015647	NCP	%	113			70-130	Pass	
Anthracene	B23-No0015647	NCP	%	114			70-130	Pass	
Benz(a)anthracene	B23-No0014923	NCP	%	130			70-130	Pass	
Benzo(a)pyrene	B23-No0014923	NCP	%	95			70-130	Pass	
Benzo(b&j)fluoranthene	B23-No0015647	NCP	%	102			70-130	Pass	
Benzo(g.h.i)perylene	B23-No0014923	NCP	%	97			70-130	Pass	
Benzo(k)fluoranthene	B23-No0015647	NCP	%	86			70-130	Pass	
Chrysene	B23-No0014923	NCP	%	104			70-130	Pass	
Dibenz(a.h)anthracene	B23-No0014923	NCP	%	112			70-130	Pass	
Fluoranthene	B23-No0014923	NCP	%	126			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fluorene	B23-No0014923	NCP	%	125			70-130	Pass	
Indeno(1.2.3-cd)pyrene	B23-No0014923	NCP	%	122			70-130	Pass	
Naphthalene	B23-No0015647	NCP	%	116			70-130	Pass	
Phenanthrene	B23-No0015647	NCP	%	110			70-130	Pass	
Pyrene	B23-No0014923	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	B23-No0019195	NCP	%	82			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S23-Oc0074308	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S23-Oc0074308	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	S23-Oc0074308	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S23-Oc0074308	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Mevinphos	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S23-Oc0074308	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S23-Oc0074308	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S23-Oc0074308	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S23-Oc0074308	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	S23-Oc0074308	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S23-Oc0074308	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	S23-Oc0074308	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	S23-Oc0074308	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	S23-Oc0074308	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	S23-Oc0074308	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	S23-Oc0074308	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S23-Oc0069691	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S23-Oc0069691	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S23-Oc0069691	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S23-Oc0069691	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	S23-Oc0069691	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S23-Oc0069691	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S23-Oc0069691	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S23-Oc0069691	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S23-Oc0069691	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S23-Oc0069691	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Nitrophenol	S23-Oc0069691	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	S23-Oc0069691	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S23-Oc0069691	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S23-Oc0069691	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S23-Oc0069691	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S23-Oc0069691	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S23-Oc0069691	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S23-Oc0069691	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B23-Oc0074636	CP	mg/kg	5.7	5.0	13	30%	Pass	
Chromium	B23-Oc0074636	CP	mg/kg	22	21	3.0	30%	Pass	
Copper	B23-Oc0074636	CP	mg/kg	26	21	20	30%	Pass	
Lead	B23-Oc0074636	CP	mg/kg	11	12	5.1	30%	Pass	
Mercury	B23-Oc0074636	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	B23-Oc0074636	CP	mg/kg	24	21	12	30%	Pass	
Zinc	B23-Oc0074636	CP	mg/kg	81	68	17	30%	Pass	

Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	B23-Oc0074636	CP	%	18	19	3.6	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B23-No0019287	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	B23-No0020944	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	B23-No0020944	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B23-No0020944	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B23-No0019287	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B23-No0019287	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B23-No0019287	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B23-No0019287	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	B23-No0019287	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	B23-No0019287	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B23-No0019287	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B23-No0019287	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	B23-No0014921	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B23-No0020944	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B23-No0020944	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B23-No0020944	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Cadmium	B23-No0017098	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Comments

Analysis of Crystalline Silica has been completed by AGON SA, report reference JL4847-14.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised by:

Paige Howarth	Analytical Services Manager
Angelique Lang-Frey	Senior Analyst-Volatile
Jonathon Angell	Senior Analyst-Metal
Jonathon Angell	Senior Analyst-Organic
Jonathon Angell	Senior Analyst-Sample Properties
Jonathon Angell	Senior Analyst-Volatile
Mickael Ros	Senior Analyst-Metal
Raymond Siu	Senior Analyst-Volatile
Roopesh Rangarajan	Senior Analyst-Organic



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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CHAIN OF CUSTODY RECORD

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☑ **Brisbane Laboratory** Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory** Unit 2 91 Leach Highway Kewdale WA 6105 08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory** 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project - MOUNT ISA CITY COUNCIL (MIS)	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Nattapong Sumonta	
Handed over by	Nattapong Sumonta	
Email for Invoice	apinvoices@douglaspartners.com.au	
Email for Results	Dawit.Bekele@douglaspartners.com.au	

Containers (Change container type & size if necessary)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked. ♦Surcharge will apply)

☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

Analyses Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	MIS-TP15_H1/0.0 - 0.2	28/11/23	S	X		X								1	1	Please hold all the remaining samples
2	MIS-TP15_H1/ 0.3 - 0.5	28/11/23	S											1		
3	MIS-TP15_H1/ 0.8 - 1.0	28/11/23	S											1		
4	MIS-TP15_H1/ 1.3 - 1.5	28/11/23	S											1		
5	MIS-BH27_H1/0.0 - 0.2	30/10/23	S											1	1	
6	MIS-BH27_H1/ 0.3 - 0.5	30/10/23	S	X										1		
7	MIS-BH27_H1/ 0.8 - 1.0	30/10/23	S											1		
8	MIS-BH27_H1/ 1.3 - 1.5	30/10/23	S											1		
9	R1				X									1		
10	S1													1		On hold
	Total Counts			2	1	1								10	2	

Date/Time: 8/12/23 3:45pm
Chilled: Yes / No
Temp:
Correction: 14.3
Final Temp:
Alex Knight

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Signature	Date / Time
Eurofins | mgt Laboratory Use Only	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature
	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

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☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	**Project №**	200446.02
Address	439 Montague Road, West End Qld 4101	**Project Name**	CopperString 2.0 Project - MOUNT ISA CITY COUNCIL (MIS)
Contact Name	Dawit Bekele	**Project Manager**	Dawit Bekele
Phone №	0499 289 560	**EDD Format** ESdat, EQuIS etc	Esdat
Special Directions		**Sampler(s)**	Nattapong Sumonta
Purchase Order		**Handed over by**	Nattapong Sumonta
Quote ID №		**Email for Invoice**	apinvoices@douglaspartners.com.au
		Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses
Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	Containers: 500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	MIS-BH5_H1/0.1 - 0.3	30/11/23	S	X										1	1	Please hold all the remaining samples
2	MIS-BH5_H1/ 0.3 - 0.5	30/11/23	S											1		
3	MIS-BH5_H1/ 0.8 - 1.0	30/11/23	S											1		
4	MIS-BH5_H1/ 1.3 - 1.5*	30/11/23	S											1		
5	MIS-TP9_H1/0.0 - 0.2	29/11/23	S			X								1	1	
6	MIS-TP9_H1/ 0.3 - 0.5	29/11/23	S	X										1		
7	MIS-TP9_H1/ 0.8 - 1.0	29/11/23	S											1		
8	MIS-TP9_H1/ 1.3 - 1.5	29/11/23	S											1		
9	Trip blank						X									
10	Trip Spike						X									
	Total Counts			2		1	2							8	2	

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal

	Name		Signature		Date		Time	
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW		Date		Time	Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW		Date		Time	Report №

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☐ **Perth Laboratory** Unit 2 91 Leach Highway Kewdale WA 6105 08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory** 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	**Project №**	200446.02	**Project Manager**	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	**Project Name**	CopperString 2.0 Project - MOUNT ISA CITY COUNCIL (MIS)	**EDD Format** ESdat, EQuIS etc	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Nattapong Sumonta
Handed over by	Nattapong Sumonta
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing

Containers Change container type & size if necessary

Required Turnaround Time (TAT) Default will be 5 days if not ticked.

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦ ☐ Same day♦ ☐ 1 day♦ ☐ 2 days♦ ☐ 3 days♦ ☑ 5 days (Standard) ☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	MIS-BH8_H1/0.0 - 0.1	29/11/23	S											1	1	Please hold all the remaining samples
2	MIS-BH8_H1/ 0.3 - 0.5	29/11/23	S											1		
3	MIS-BH8_H1/ 0.8 - 1.0	29/11/23	S											1		
4	MIS-BH8_H1/ 1.3 - 1.5	29/11/23	S	✖										1		
5	MIS-TP6_H1/0.0 - 0.2	30/11/23	S											1	1	
6	MIS-TP6_H1/ 0.3 - 0.5	30/11/23	S	✖										1		
7	MIS-TP6_H1/ 0.8 - 1.0	30/11/23	S											1		
8	MIS-TP6_H1/ 1.3 - 1.5	30/11/23	S											1		
9																
10																
	Total Counts			2										8	2	

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal Name Signature Date Time

Eurofins | mgt Laboratory Use Only

Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request

eurofins | Environment Testing

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Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

Eurofins ARL Pty Ltd

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Site# 2370

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Auckland	Auckland (Asb)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	Douglas Partners (Qld) Pty Ltd
Contact name:	Dawit Bekele
Project name:	COPPERSTRING 2.0 PROJECT - MOUNT ISA CITY COUNCIL (MIS)
Project ID:	200446.02
Turnaround time:	5 Day
Date/Time received	Dec 8, 2023 3:45 PM
Eurofins reference	1052671

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Extra sample received 'MIS-BH8_H1/0.0-0.2' and put on hold.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Zoe Flynn on phone : or by email: ZoeFlynn@eurofins.com

Results will be delivered electronically via email to Dawit Bekele - Dawit.Bekele@douglaspartners.com.au.

Note: A copy of these results will also be delivered to the general Douglas Partners (Qld) Pty Ltd email address.

Douglas Partners Pty Ltd
439 Montague Road
West End
QLD 4101

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Dawit Bekele**

Report **1052671-S**
Project name COPPERSTRING 2.0 PROJECT - MOUNT ISA CITY COUNCIL (MIS)
Project ID 200446.02
Received Date Dec 08, 2023

Client Sample ID			**MIS-TP15_H1/0.0-0.2**	**MIS-BH27_H1/0.8-1.0**	**R1**	**MIS-BH5_H1/0.1-0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-De0023558**	**B23-De0023559**	**B23-De0023560**	**B23-De0023561**
Date Sampled			**Nov 28, 2023**	**Nov 30, 2023**	**Not Provided**[I12]	**Nov 30, 2023**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	78	83	84	87
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			MIS-TP15_H1/0.0-0.2	MIS-BH27_H1/0.8-1.0	R1	MIS-BH5_H1/0.1-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-De0023558	B23-De0023559	B23-De0023560	B23-De0023561
Date Sampled			Nov 28, 2023	Nov 30, 2023	Not Provided[I12]	Nov 30, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	84	91	85	87
p-Terphenyl-d14 (surr.)	1	%	87	69	80	89
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	105	82	-	98
Tetrachloro-m-xylene (surr.)	1	%	58	93	-	114
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	-	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2

Client Sample ID			MIS-TP15_H1/0.0-0.2	MIS-BH27_H1/0.8-1.0	R1	MIS-BH5_H1/0.1-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-De0023558	B23-De0023559	B23-De0023560	B23-De0023561
Date Sampled			Nov 28, 2023	Nov 30, 2023	Not Provided[I12]	Nov 30, 2023
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	-	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Omethoate	2	mg/kg	< 2	< 2	-	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Triphenylphosphate (surr.)	1	%	63	INT	-	51
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	105	82	-	98
Tetrachloro-m-xylene (surr.)	1	%	58	93	-	114
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1

Client Sample ID			MIS-TP15_H1/0.0-0.2	MIS-BH27_H1/0.8-1.0	R1	MIS-BH5_H1/0.1-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-De0023558	B23-De0023559	B23-De0023560	B23-De0023561
Date Sampled			Nov 28, 2023	Nov 30, 2023	Not Provided[I12]	Nov 30, 2023
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Nitrophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	68	69	66	65
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	9.3	47	5.3	< 2
Cadmium	0.5	mg/kg	2.6	< 0.5	< 0.5	< 0.5
Chromium	5	mg/kg	10	21	27	31
Copper	5	mg/kg	63	40	38	83
Lead	5	mg/kg	59	83	44	26
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	34	13	19	25
Zinc	5	mg/kg	910	190	84	110
Sample Properties						
% Moisture	1	%	3.6	21	19	18

Client Sample ID			MIS-TP9_H1/0.0-0.2	MIS-TP9_H1/0.3-0.5	TRIP BLANK	[R20]TRIP SPIKE
Sample Matrix			Soil	Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			B23-De0023562	B23-De0023563	B23-De0023564	B23-De0023565
Date Sampled			Nov 29, 2023	Nov 29, 2023	Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	< 20	-
TRH C10-C14	20	mg/kg	-	< 20	-	-
TRH C15-C28	50	mg/kg	-	< 50	-	-
TRH C29-C36	50	mg/kg	-	< 50	-	-
TRH C10-C36 (Total)	50	mg/kg	-	< 50	-	-

Client Sample ID			MIS-TP9_H1/0.0-0.2	MIS-TP9_H1/0.3-0.5	TRIP BLANK	[R20]TRIP SPIKE
Sample Matrix			Soil	Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			B23-De0023562	B23-De0023563	B23-De0023564	B23-De0023565
Date Sampled			Nov 29, 2023	Nov 29, 2023	Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	-
Xylenes - Total*	0.3	mg/kg	-	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	86	88	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	-
TRH C6-C10	20	mg/kg	-	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	-
Acenaphthene	0.5	mg/kg	-	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	-
Anthracene	0.5	mg/kg	-	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Chrysene	0.5	mg/kg	-	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	-
Fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Fluorene	0.5	mg/kg	-	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	-
Naphthalene	0.5	mg/kg	-	< 0.5	-	-
Phenanthrene	0.5	mg/kg	-	< 0.5	-	-
Pyrene	0.5	mg/kg	-	< 0.5	-	-
Total PAH*	0.5	mg/kg	-	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	-	88	-	-
p-Terphenyl-d14 (surr.)	1	%	-	73	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-HCH	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-HCH	0.05	mg/kg	-	< 0.05	-	-
d-HCH	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-

Client Sample ID			MIS-TP9_H1/0.0-0.2	MIS-TP9_H1/0.3-0.5	TRIP BLANK	[R20]TRIP SPIKE
Sample Matrix			Soil	Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			B23-De0023562	B23-De0023563	B23-De0023564	B23-De0023565
Date Sampled			Nov 29, 2023	Nov 29, 2023	Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.05	mg/kg	-	< 0.05	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	-	91	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	137	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Bolstar	0.2	mg/kg	-	< 0.2	-	-
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	-	-
Coumaphos	2	mg/kg	-	< 2	-	-
Demeton-S	0.2	mg/kg	-	< 0.2	-	-
Demeton-O	0.2	mg/kg	-	< 0.2	-	-
Diazinon	0.2	mg/kg	-	< 0.2	-	-
Dichlorvos	0.2	mg/kg	-	< 0.2	-	-
Dimethoate	0.2	mg/kg	-	< 0.2	-	-
Disulfoton	0.2	mg/kg	-	< 0.2	-	-
EPN	0.2	mg/kg	-	< 0.2	-	-
Ethion	0.2	mg/kg	-	< 0.2	-	-
Ethoprop	0.2	mg/kg	-	< 0.2	-	-
Ethyl parathion	0.2	mg/kg	-	< 0.2	-	-
Fenitrothion	0.2	mg/kg	-	< 0.2	-	-
Fensulfothion	0.2	mg/kg	-	< 0.2	-	-
Fenthion	0.2	mg/kg	-	< 0.2	-	-
Malathion	0.2	mg/kg	-	< 0.2	-	-
Merphos	0.2	mg/kg	-	< 0.2	-	-
Methyl parathion	0.2	mg/kg	-	< 0.2	-	-
Mevinphos	0.2	mg/kg	-	< 0.2	-	-
Monocrotophos	2	mg/kg	-	< 2	-	-
Naled	0.2	mg/kg	-	< 0.2	-	-
Omethoate	2	mg/kg	-	< 2	-	-
Phorate	0.2	mg/kg	-	< 0.2	-	-
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Pyrazophos	0.2	mg/kg	-	< 0.2	-	-
Ronnel	0.2	mg/kg	-	< 0.2	-	-
Terbufos	0.2	mg/kg	-	< 0.2	-	-
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	-	-

Client Sample ID			MIS-TP9_H1/0.0-0.2	MIS-TP9_H1/0.3-0.5	TRIP BLANK	[R20]TRIP SPIKE
Sample Matrix			Soil	Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			B23-De0023562	B23-De0023563	B23-De0023564	B23-De0023565
Date Sampled			Nov 29, 2023	Nov 29, 2023	Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Tokuthion	0.2	mg/kg	-	< 0.2	-	-
Trichloronate	0.2	mg/kg	-	< 0.2	-	-
Triphenylphosphate (surr.)	1	%	-	61	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	-
Total PCB*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	-	91	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	137	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	< 0.5	-	-
2.4-Dichlorophenol	0.5	mg/kg	-	< 0.5	-	-
2.4.5-Trichlorophenol	1	mg/kg	-	< 1	-	-
2.4.6-Trichlorophenol	1	mg/kg	-	< 1	-	-
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	-	-
4-Chloro-3-methylphenol	1	mg/kg	-	< 1	-	-
Pentachlorophenol	1	mg/kg	-	< 1	-	-
Tetrachlorophenols - Total	10	mg/kg	-	< 10	-	-
Total Halogenated Phenol*	1	mg/kg	-	< 1	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	< 20	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	< 5	-	-
2-Nitrophenol	1.0	mg/kg	-	< 1	-	-
2.4-Dimethylphenol	0.5	mg/kg	-	< 0.5	-	-
2.4-Dinitrophenol	5	mg/kg	-	< 5	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	-	-
Total cresols*	0.5	mg/kg	-	< 0.5	-	-
4-Nitrophenol	5	mg/kg	-	< 5	-	-
Dinoseb	20	mg/kg	-	< 20	-	-
Phenol	0.5	mg/kg	-	< 0.5	-	-
Phenol-d6 (surr.)	1	%	-	69	-	-
Total Non-Halogenated Phenol*	20	mg/kg	-	< 20	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	< 50	-	-
TRH >C16-C34	100	mg/kg	-	< 100	-	-
TRH >C34-C40	100	mg/kg	-	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	-	-

Client Sample ID			MIS-TP9_H1/0.0-0.2	MIS-TP9_H1/0.3-0.5	TRIP BLANK	[R20]TRIP SPIKE
Sample Matrix			Soil	Soil	Trip Blank (solid)	Trip Spike (solid)
Eurofins Sample No.			B23-De0023562	B23-De0023563	B23-De0023564	B23-De0023565
Date Sampled			Nov 29, 2023	Nov 29, 2023	Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	-	42	-	-
Cadmium	0.5	mg/kg	-	0.7	-	-
Chromium	5	mg/kg	-	7.5	-	-
Copper	5	mg/kg	-	24	-	-
Lead	5	mg/kg	-	28	-	-
Mercury	0.1	mg/kg	-	< 0.1	-	-
Nickel	5	mg/kg	-	16	-	-
Zinc	5	mg/kg	-	180	-	-
Sample Properties						
% Moisture	1	%	4.8	7.2	-	-
Naphthalene[N02]	0.5	mg/kg	-	-	< 0.5	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	< 20	-
Naphthalene	1	%	-	-	-	29
TRH C6-C10	1	%	-	-	-	20
TRH C6-C9	1	%	-	-	-	19
Total Recoverable Hydrocarbons						
TRH C6-C10	20	mg/kg	-	-	< 20	-
BTEX						
Benzene	1	%	-	-	-	2.9
Ethylbenzene	1	%	-	-	-	6.6
m&p-Xylenes	1	%	-	-	-	7.6
o-Xylene	1	%	-	-	-	6.5
Toluene	1	%	-	-	-	5.9
Xylenes - Total	1	%	-	-	-	7.0
4-Bromofluorobenzene (surr.)	1	%	-	-	-	104

Client Sample ID			MIS-BH8_H1/1.3-1.5	MIS-TP6_H1/0.3-0.5
Sample Matrix			Soil	Soil
Eurofins Sample No.			B23-De0023566	B23-De0023567
Date Sampled			Nov 29, 2023	Nov 30, 2023
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	84	83

Client Sample ID			MIS-BH8_H1/1.3-1.5	MIS-TP6_H1/0.3-0.5
Sample Matrix			Soil	Soil
Eurofins Sample No.			B23-De0023566	B23-De0023567
Date Sampled			Nov 29, 2023	Nov 30, 2023
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	90	112
p-Terphenyl-d14 (surr.)	1	%	81	103
Organochlorine Pesticides				
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05

Client Sample ID			MIS-BH8_H1/1.3-1.5	MIS-TP6_H1/0.3-0.5
Sample Matrix			Soil	Soil
Eurofins Sample No.			B23-De0023566	B23-De0023567
Date Sampled			Nov 29, 2023	Nov 30, 2023
Test/Reference	LOR	Unit		
Organochlorine Pesticides				
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	143	83
Tetrachloro-m-xylene (surr.)	1	%	76	142
Organophosphorus Pesticides				
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	51	79
Polychlorinated Biphenyls				
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1

Client Sample ID			MIS-BH8_H1/1.3-1.5	MIS-TP6_H1/0.3-0.5
Sample Matrix			Soil	Soil
Eurofins Sample No.			B23-De0023566	B23-De0023567
Date Sampled			Nov 29, 2023	Nov 30, 2023
Test/Reference	LOR	Unit		
Polychlorinated Biphenyls				
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	143	83
Tetrachloro-m-xylene (surr.)	1	%	76	142
Phenols (Halogenated)				
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1
Phenols (non-Halogenated)				
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5
2-Nitrophenol	1.0	mg/kg	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	75	91
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100
Heavy Metals				
Arsenic	2	mg/kg	2.6	12
Cadmium	0.5	mg/kg	< 0.5	1.1
Chromium	5	mg/kg	23	7.0
Copper	5	mg/kg	32	52
Lead	5	mg/kg	44	35
Mercury	0.1	mg/kg	< 0.1	< 0.1
Nickel	5	mg/kg	16	11
Zinc	5	mg/kg	78	190
Sample Properties				
% Moisture	1	%	20	14

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Brisbane	Dec 12, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Brisbane	Dec 12, 2023	14 Days
- Method: USEPA SW846 8260			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Brisbane	Dec 12, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Naphthalene	Brisbane	Dec 12, 2023	14 Days
- Method: USEPA 8260B - MGT 350A Volatile Organics by GCMS			
Total Recoverable Hydrocarbons	Brisbane	Dec 12, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Eurofins Suite B7A			
Polycyclic Aromatic Hydrocarbons	Brisbane	Dec 12, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Brisbane	Dec 12, 2023	14 Days
- Method: USEPA M 8270 (LTM-ORG-2130 PAH & Phenols in Soil & Water by GC-MS)			
Phenols (non-Halogenated)	Brisbane	Dec 12, 2023	14 Days
- Method: USEPA M 8270 (LTM-ORG-2130 PAH & Phenols in Soil & Water by GC-MS)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Brisbane	Dec 12, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Brisbane	Dec 12, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Brisbane	Dec 12, 2023	14 Days
- Method: LTM-ORG-2220 OCP and PCB in Soil and Water			
Organophosphorus Pesticides	Brisbane	Dec 12, 2023	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8270)			
Polychlorinated Biphenyls	Melbourne	Dec 13, 2023	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)			
% Moisture	Brisbane	Dec 11, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
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Order No.:
Report #: 1052671
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Dec 8, 2023 3:45 PM
Due: Dec 15, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 2.0 PROJECT - MOUNT ISA CITY COUNCIL (MIS)
Project ID: 200446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica - Total	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X				
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X
Perth Laboratory - NATA # 2377 Site # 2370						X						
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	MIS-TP15_H1/0.0-0.2	Nov 28, 2023		Soil	B23-De0023558	X		X	X	X		
2	MIS-BH27_H1/0.8-1.0	Nov 30, 2023		Soil	B23-De0023559			X	X	X		
3	R1	Not Provided		Soil	B23-De0023560				X	X		
4	MIS-BH5_H1/0.1-0.3	Nov 30, 2023		Soil	B23-De0023561			X	X	X		
5	MIS-TP9_H1/0.0-0.2	Nov 29, 2023		Soil	B23-De0023562	X			X			
6	MIS-	Nov 29, 2023		Soil	B23-De0023563			X	X	X		

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Sample Detail						Crystalline Silica - Total	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X				
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X
Perth Laboratory - NATA # 2377 Site # 2370						X						
	TP9_H1/0.3-0.5											
7	TRIP BLANK	Not Provided		Trip Blank (solid)	B23-De0023564						X	
8	TRIP SPIKE	Not Provided		Trip Spike (solid)	B23-De0023565						X	X
9	MIS-BH8_H1/1.3-1.5	Nov 29, 2023		Soil	B23-De0023566			X	X	X		
10	MIS-TP6_H1/0.3-0.5	Nov 30, 2023		Soil	B23-De0023567			X	X	X		
11	MIS-TP15_H1/0.3-0.5	Nov 28, 2023		Soil	B23-De0023568		X					
12	MIS-TP15_H1/0.8-	Nov 28, 2023		Soil	B23-De0023569		X					

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Sample Detail						Crystalline Silica - Total	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X				
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X
Perth Laboratory - NATA # 2377 Site # 2370						X						
	1.0											
13	MIS-TP15_H1/1.3-1.5	Nov 28, 2023		Soil	B23-De0023570		X					
14	MIS-BH27_H1/0.0-0.2	Nov 30, 2023		Soil	B23-De0023571		X					
15	MIS-BH27_H1/0.3-0.5	Nov 30, 2023		Soil	B23-De0023572		X					
16	MIS-BH27_H1/1.3-1.5	Nov 30, 2023		Soil	B23-De0023573		X					
17	S1	Not Provided		Soil	B23-De0023574		X					
18	MIS-BH5_H1/0.3-0.5	Nov 30, 2023		Soil	B23-De0023575		X					

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
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Sample Detail						Crystalline Silica - Total	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X				
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X
Perth Laboratory - NATA # 2377 Site # 2370						X						
19	MIS-BH5_H1/0.8-1.0	Nov 30, 2023		Soil	B23-De0023576		X					
20	MIS-BH5_H1/1.3-1.5	Nov 30, 2023		Soil	B23-De0023577		X					
21	MIS-TP9_H1/0.8-1.0	Nov 29, 2023		Soil	B23-De0023578		X					
22	MIS-TP9_H1/1.3-1.5	Nov 29, 2023		Soil	B23-De0023579		X					
23	MIS-BH8_H1/0.1-0.3	Nov 29, 2023		Soil	B23-De0023580		X					
24	MIS-BH8_H1/0.3-0.5	Nov 29, 2023		Soil	B23-De0023581		X					

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Melbourne Laboratory - NATA # 1261 Site # 1254								X				
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X
Perth Laboratory - NATA # 2377 Site # 2370						X						
25	MIS-BH8_H1/0.8-1.0	Nov 29, 2023		Soil	B23-De0023582		X					
26	MIS-TP6_H1/0.0-0.2	Nov 30, 2023		Soil	B23-De0023583		X					
27	MIS-TP6_H1/0.8-1.0	Nov 30, 2023		Soil	B23-De0023584		X					
28	MIS-TP6_H1/1.3-1.5	Nov 30, 2023		Soil	B23-De0023585		X					
29	MIS-BH8_H1/0.0-0.2	Nov 29, 2023		Soil	B23-De0032069		X					
Test Counts						2	19	6	8	7	2	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit	**Colour:** Pt-Co Units	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Phenols (Halogenated)							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 10			10	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.5			0.5	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	97			70-130	Pass	
TRH C10-C14	%	71			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	100			70-130	Pass	
Toluene	%	95			70-130	Pass	
Ethylbenzene	%	101			70-130	Pass	
m&p-Xylenes	%	98			70-130	Pass	
Xylenes - Total*	%	98			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	%	99			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	84			70-130	Pass	
Acenaphthylene	%	91			70-130	Pass	
Anthracene	%	107			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benz(a)anthracene	%	80			70-130	Pass	
Benzo(a)pyrene	%	76			70-130	Pass	
Benzo(b&j)fluoranthene	%	84			70-130	Pass	
Benzo(g.h.i)perylene	%	116			70-130	Pass	
Benzo(k)fluoranthene	%	98			70-130	Pass	
Chrysene	%	95			70-130	Pass	
Dibenz(a.h)anthracene	%	121			70-130	Pass	
Fluoranthene	%	122			70-130	Pass	
Fluorene	%	118			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	73			70-130	Pass	
Naphthalene	%	77			70-130	Pass	
Phenanthrene	%	85			70-130	Pass	
Pyrene	%	114			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	79			70-130	Pass	
4.4'-DDD	%	102			70-130	Pass	
4.4'-DDE	%	104			70-130	Pass	
4.4'-DDT	%	101			70-130	Pass	
a-HCH	%	87			70-130	Pass	
Aldrin	%	130			70-130	Pass	
b-HCH	%	121			70-130	Pass	
d-HCH	%	120			70-130	Pass	
Dieldrin	%	72			70-130	Pass	
Endosulfan I	%	112			70-130	Pass	
Endosulfan II	%	102			70-130	Pass	
Endosulfan sulphate	%	128			70-130	Pass	
Endrin	%	92			70-130	Pass	
Endrin aldehyde	%	125			70-130	Pass	
Endrin ketone	%	91			70-130	Pass	
g-HCH (Lindane)	%	107			70-130	Pass	
Heptachlor	%	116			70-130	Pass	
Heptachlor epoxide	%	97			70-130	Pass	
Hexachlorobenzene	%	89			70-130	Pass	
Methoxychlor	%	114			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Azinphos-methyl	%	99			70-130	Pass	
Bolstar	%	126			70-130	Pass	
Chlorpyrifos	%	85			70-130	Pass	
Chlorpyrifos-methyl	%	86			70-130	Pass	
Coumaphos	%	85			70-130	Pass	
Demeton-S	%	97			70-130	Pass	
Demeton-O	%	91			70-130	Pass	
Diazinon	%	96			70-130	Pass	
Dichlorvos	%	123			70-130	Pass	
Dimethoate	%	103			70-130	Pass	
Disulfoton	%	100			70-130	Pass	
EPN	%	113			70-130	Pass	
Ethion	%	122			70-130	Pass	
Ethoprop	%	94			70-130	Pass	
Ethyl parathion	%	126			70-130	Pass	
Fenitrothion	%	110			70-130	Pass	
Fensulfothion	%	108			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fenthion	%	111			70-130	Pass	
Malathion	%	117			70-130	Pass	
Methyl parathion	%	105			75-125	Pass	
Mevinphos	%	109			70-130	Pass	
Monocrotophos	%	96			70-130	Pass	
Naled	%	107			70-130	Pass	
Phorate	%	122			70-130	Pass	
Pyrazophos	%	112			70-130	Pass	
Ronnel	%	97			70-130	Pass	
Terbufos	%	130			70-130	Pass	
Tetrachlorvinphos	%	112			70-130	Pass	
Tokuthion	%	100			70-130	Pass	
Trichloronate	%	106			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	78			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	77			25-140	Pass	
2.4-Dichlorophenol	%	67			25-140	Pass	
2.4.5-Trichlorophenol	%	40			25-140	Pass	
2.4.6-Trichlorophenol	%	50			25-140	Pass	
2.6-Dichlorophenol	%	95			25-140	Pass	
4-Chloro-3-methylphenol	%	62			25-140	Pass	
Pentachlorophenol	%	117			25-140	Pass	
Tetrachlorophenols - Total	%	85			25-140	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	38			25-140	Pass	
2-Methyl-4.6-dinitrophenol	%	34			25-140	Pass	
2-Nitrophenol	%	95			25-140	Pass	
2.4-Dimethylphenol	%	72			25-140	Pass	
2.4-Dinitrophenol	%	42			25-140	Pass	
2-Methylphenol (o-Cresol)	%	57			25-140	Pass	
3&4-Methylphenol (m&p-Cresol)	%	87			25-140	Pass	
4-Nitrophenol	%	112			25-140	Pass	
Dinoseb	%	109			25-140	Pass	
Phenol	%	71			25-140	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	71			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	87			80-120	Pass	
Cadmium	%	103			80-120	Pass	
Chromium	%	91			80-120	Pass	
Copper	%	92			80-120	Pass	
Lead	%	94			80-120	Pass	
Mercury	%	101			80-120	Pass	
Nickel	%	95			80-120	Pass	
Zinc	%	92			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	B23-De0021063	NCP	%	94			70-130	Pass	
Acenaphthylene	B23-De0021063	NCP	%	97			70-130	Pass	
Anthracene	B23-De0021063	NCP	%	73			70-130	Pass	
Benz(a)anthracene	B23-De0021063	NCP	%	84			70-130	Pass	
Benzo(a)pyrene	B23-De0021063	NCP	%	103			70-130	Pass	
Benzo(b&j)fluoranthene	B23-De0021063	NCP	%	116			70-130	Pass	
Benzo(g.h.i)perylene	B23-De0021063	NCP	%	102			70-130	Pass	
Benzo(k)fluoranthene	B23-De0027590	NCP	%	74			70-130	Pass	
Chrysene	B23-De0021063	NCP	%	85			70-130	Pass	
Dibenz(a.h)anthracene	B23-De0021063	NCP	%	101			70-130	Pass	
Fluoranthene	B23-De0021063	NCP	%	102			70-130	Pass	
Fluorene	B23-De0021063	NCP	%	81			70-130	Pass	
Indeno(1.2.3-cd)pyrene	B23-De0021063	NCP	%	119			70-130	Pass	
Naphthalene	B23-De0021063	NCP	%	90			70-130	Pass	
Phenanthrene	B23-De0027590	NCP	%	70			70-130	Pass	
Pyrene	B23-De0021063	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	B23-De0027590	NCP	%	109			70-130	Pass	
4.4'-DDD	B23-De0027590	NCP	%	106			70-130	Pass	
4.4'-DDE	B23-De0027590	NCP	%	78			70-130	Pass	
4.4'-DDT	B23-De0027590	NCP	%	115			70-130	Pass	
a-HCH	B23-De0020999	NCP	%	130			70-130	Pass	
Aldrin	B23-De0027590	NCP	%	106			70-130	Pass	
b-HCH	B23-De0027590	NCP	%	88			70-130	Pass	
d-HCH	B23-De0027590	NCP	%	91			70-130	Pass	
Dieldrin	B23-De0027590	NCP	%	97			70-130	Pass	
Endosulfan I	B23-De0027590	NCP	%	84			70-130	Pass	
Endosulfan II	B23-De0027590	NCP	%	88			70-130	Pass	
Endosulfan sulphate	B23-De0027590	NCP	%	104			70-130	Pass	
Endrin	B23-De0027590	NCP	%	101			70-130	Pass	
Endrin aldehyde	B23-De0027590	NCP	%	77			70-130	Pass	
Endrin ketone	B23-De0027590	NCP	%	80			70-130	Pass	
g-HCH (Lindane)	B23-De0027590	NCP	%	83			70-130	Pass	
Heptachlor	B23-De0027590	NCP	%	92			70-130	Pass	
Heptachlor epoxide	B23-De0027590	NCP	%	118			70-130	Pass	
Hexachlorobenzene	B23-De0027590	NCP	%	126			70-130	Pass	
Methoxychlor	B23-De0027590	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Azinphos-methyl	B23-De0040696	NCP	%	110			70-130	Pass	
Bolstar	B23-De0027590	NCP	%	76			70-130	Pass	
Chlorfenvinphos	B23-De0008413	NCP	%	126			70-130	Pass	
Chlorpyrifos	B23-De0027590	NCP	%	120			70-130	Pass	
Chlorpyrifos-methyl	B23-De0027590	NCP	%	100			70-130	Pass	
Coumaphos	B23-De0040696	NCP	%	110			70-130	Pass	
Demeton-S	B23-De0027590	NCP	%	72			70-130	Pass	
Demeton-O	B23-De0027590	NCP	%	126			70-130	Pass	
Diazinon	B23-De0027590	NCP	%	79			70-130	Pass	
Dichlorvos	B23-De0027590	NCP	%	107			70-130	Pass	
Dimethoate	B23-De0020999	NCP	%	87			70-130	Pass	
Disulfoton	B23-De0027590	NCP	%	73			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
EPN	B23-De0027590	NCP	%	86			70-130	Pass	
Ethion	B23-De0027590	NCP	%	107			70-130	Pass	
Ethoprop	B23-De0027590	NCP	%	72			70-130	Pass	
Ethyl parathion	B23-De0027590	NCP	%	97			70-130	Pass	
Fenitrothion	B23-De0027590	NCP	%	109			70-130	Pass	
Fensulfothion	B23-De0040684	NCP	%	125			70-130	Pass	
Fenthion	B23-De0027590	NCP	%	93			70-130	Pass	
Malathion	B23-De0020999	NCP	%	113			70-130	Pass	
Methyl parathion	B23-De0027590	NCP	%	85			70-130	Pass	
Mevinphos	B23-De0027590	NCP	%	85			70-130	Pass	
Monocrotophos	B23-De0020999	NCP	%	97			70-130	Pass	
Naled	B23-De0002674	NCP	%	85			70-130	Pass	
Omethoate	B23-De0020999	NCP	%	125			70-130	Pass	
Phorate	B23-De0027590	NCP	%	111			70-130	Pass	
Pirimiphos-methyl	B23-De0009458	NCP	%	129			70-130	Pass	
Pyrazophos	B23-De0027590	NCP	%	116			70-130	Pass	
Ronnel	B23-De0027590	NCP	%	73			70-130	Pass	
Terbufos	B23-De0027590	NCP	%	113			70-130	Pass	
Tetrachlorvinphos	B23-De0027590	NCP	%	98			70-130	Pass	
Tokuthion	B23-De0027590	NCP	%	91			70-130	Pass	
Trichloronate	B23-De0027590	NCP	%	130			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	M23-De0027900	NCP	%	95			70-130	Pass	
Aroclor-1260	M23-De0027900	NCP	%	78			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	B23-De0021063	NCP	%	85			30-130	Pass	
2.4-Dichlorophenol	B23-De0021063	NCP	%	56			30-130	Pass	
2.4.5-Trichlorophenol	B23-De0021063	NCP	%	60			30-130	Pass	
2.4.6-Trichlorophenol	B23-De0021063	NCP	%	71			30-130	Pass	
2.6-Dichlorophenol	B23-De0021063	NCP	%	109			30-130	Pass	
4-Chloro-3-methylphenol	B23-De0021063	NCP	%	66			30-130	Pass	
Tetrachlorophenols - Total	B23-De0021063	NCP	%	77			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	B23-De0033934	NCP	%	77			30-130	Pass	
2-Nitrophenol	B23-De0021063	NCP	%	104			30-130	Pass	
2.4-Dimethylphenol	B23-De0021063	NCP	%	69			30-130	Pass	
2.4-Dinitrophenol	B23-De0021063	NCP	%	115			30-130	Pass	
2-Methylphenol (o-Cresol)	B23-De0021063	NCP	%	59			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	B23-De0021063	NCP	%	88			30-130	Pass	
4-Nitrophenol	B23-De0021063	NCP	%	116			30-130	Pass	
Dinoseb	B23-De0021063	NCP	%	129			30-130	Pass	
Phenol	B23-De0021063	NCP	%	68			30-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	B23-De0023558	CP	%	85			75-125	Pass	
Cadmium	B23-De0023558	CP	%	98			75-125	Pass	
Chromium	B23-De0023558	CP	%	94			75-125	Pass	
Copper	B23-De0023558	CP	%	111			75-125	Pass	
Lead	S23-De0026423	NCP	%	105			75-125	Pass	
Mercury	B23-De0023558	CP	%	95			75-125	Pass	
Nickel	B23-De0023558	CP	%	94			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Zinc	B23-De0023558	CP	%	117			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	B23-De0023566	CP	%	93			70-130	Pass	
TRH C10-C14	B23-De0023566	CP	%	85			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	B23-De0023566	CP	%	93			70-130	Pass	
Toluene	B23-De0023566	CP	%	92			70-130	Pass	
Ethylbenzene	B23-De0023566	CP	%	94			70-130	Pass	
m&p-Xylenes	B23-De0023566	CP	%	95			70-130	Pass	
o-Xylene	B23-De0023566	CP	%	96			70-130	Pass	
Xylenes - Total*	B23-De0023566	CP	%	95			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	B23-De0023566	CP	%	92			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	B23-De0023566	CP	%	84			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	B23-De0019134	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endrin ketone	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	B23-De0019134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	B23-De0019134	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	B23-De0019134	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	B23-De0019134	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	B23-De0026607	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	B23-De0026607	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	B23-De0026607	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	B23-De0026607	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	B23-De0026607	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	B23-De0026607	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	B23-De0026607	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	B23-De0026607	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	B23-De0019134	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	B23-De0019134	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	B23-De0019134	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	B23-De0019134	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	B23-De0019134	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	B23-De0019134	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	B23-De0019134	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Nitrophenol	B23-De0019134	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	B23-De0019134	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	B23-De0019134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	B23-De0019134	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	B23-De0019134	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	B23-De0019134	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	B23-De0019134	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B23-De0023559	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	B23-De0023559	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	B23-De0023559	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B23-De0023559	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B23-De0023559	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B23-De0023559	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B23-De0023559	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B23-De0023559	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	B23-De0023559	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	B23-De0023559	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B23-De0023559	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B23-De0023559	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B23-De0023559	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B23-De0023559	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B23-De0023559	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	B23-De0023563	CP	%	7.2	8.4	15	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B23-De0023566	CP	mg/kg	2.6	4.4	53	30%	Fail	Q15
Cadmium	B23-De0023566	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chromium	B23-De0023566	CP	mg/kg	23	23	<1	30%	Pass	
Copper	B23-De0023566	CP	mg/kg	32	33	2.4	30%	Pass	
Lead	B23-De0023566	CP	mg/kg	44	46	4.3	30%	Pass	
Mercury	B23-De0023566	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Nickel	B23-De0023566	CP	mg/kg	16	17	3.6	30%	Pass	
Zinc	B23-De0023566	CP	mg/kg	78	82	4.8	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	N/A
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised by:

Paige Howarth	Analytical Services Manager
Angelique Lang-Frey	Senior Analyst-Volatile
Jonathon Angell	Senior Analyst-Metal
Jonathon Angell	Senior Analyst-Organic
Jonathon Angell	Senior Analyst-Sample Properties
Jonathon Angell	Senior Analyst-Volatile
Joseph Edouard	Senior Analyst-Organic



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

☐ **Sydney Laboratory**
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

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☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter	
Handed over by	Luke Baxter	
Email for Invoice	apinvoices@douglaspartners.com.au	
Email for Results	Dawit.Bekele@douglaspartners.com.au	

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	103622	Containers: 500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	FLR330-BH7_H2 / 0.0 -0.2	23/09/23	S	X													
2	FLR330-BH7_H2 /0.4 -0.6	23/09/23	S														
3	FLR330-BH7_H2 / 0.8-1.0	23/09/23	S														
4	FLR330-BH7_H2 /1.4 -1.6	23/09/23	S														
5	FLR330-BH9_H2 / 0 - 0.2	24/09/23	S														
6	FLR330-BH9_H2 / 0.4 -0.6	24/09/23	S	X													
7	FLR330-BH9_H2 / 0.8-1.0	24/09/23	S														
8	FLR330-BH9_H2 / 1.6 -1.6	24/09/23	S														
9																	
10																	
		Total Counts		2													

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

Date/Time: 11/10/23 11am

Chilled: Yes / No

Temp:

Correction: 11.9

Final Temp: AK

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal | Name | Signature | Date | Time

Eurofins | mgt Laboratory Use Only

Received By | SYD | BNE | MEL | PER | ADL | NTL | DRW | Signature | Date | Time | Temperature

Received By | SYD | BNE | MEL | PER | ADL | NTL | DRW | Signature | Date | Time | Report №

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

☐ **Sydney Laboratory**
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☐ **Melbourne Laboratory**
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03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter		
Handed over by	Luke Baxter		
Email for Invoice	apinvoices@douglaspartners.com.au		
Email for Results	Dawit.Bekele@douglaspartners.com.au		

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	FLR330-BH16_H2 / 0.0 - 0.2	19/09/23	S	✖		✖										
2	FLR330-BH16_H2 / 0.4-0.6	19/09/23	S													
3	FLR330-BH16_H2 / 0.8-1.0	19/09/23	S													
4	FLR330-BH16_H2 /1.4 -1.6	19/09/23	S													
5	FLR500-TP2_H2 / 0-0.2	24/09/23	S													
6	FLR500-TP2_H2 / 0.4 - 0.6	24/09/23	S	✖												
7	FLR500-TP2_H2 /0.8-1.0	24/09/23	S													
8	FLR500-TP2_H2 / 1.4-1.6	24/09/23	S													
9																
10																
		Total Counts		2		1										

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal — Name — Signature — Date — Time

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Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature	
Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №	

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Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter	
Handed over by	Luke Baxter	
Email for Invoice	apinvoices@douglaspartners.com.au	
Email for Results	Dawit.Bekele@douglaspartners.com.au	

Containers (Change container type & size if necessary.)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked.)

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	FLR500-TP6_H2 / 0.0 - 0.2	20/09/23	S	✖		✖										
2	FLR500-TP6_H2 / 0.4-0.6	20/09/23	S													
3	FLR500-TP6_H2/ 0.8-1.0	20/09/23	S													
4	FLR500-TP6_H2 / 1.4 -1.6	20/09/23	S													
5	FLR500-BH13_H2/0.0-0.2	19/09/23	S													
6	FLR500-BH13_H2/0.4-0.6	19/09/23	S	✖												
7	FLR500-BH13_H2/0.8-1.0	19/09/23	S													
8	FLR500-BH13_H2/1.0-1.6	19/09/23	S													
9																
10																
		Total Counts		2		1										

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal | Name | Signature | Date | Time

Eurofins | mgt Laboratory Use Only						
Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature	
Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №	

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08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project	EDD Format ESdat, EQuIS etc	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter
Handed over by	Luke Baxter
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

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№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	FLR500-OTP2_H2 / 0..0-0.2	19/09/23	S	✖												
2	FLR500-OTP2_H2 / 0.4 - 0.6	19/09/23	S													
3	FLR500-OTP2_H2 /0.8-1.0	19/09/23	S													
4	FLR500-OTP2_H2 / 1.4-1.6	19/09/23	S													
5	Trip blank and trip spike	24/09/23	S				✖									
6	R1 / 0.4 - 0.6	19/09/23			✖											
7	R2															
8	S2															
9																
10																
	Total Counts			1	1		1									

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal Name Signature Date Time

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Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature	
Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №	

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☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	**Project №**	200446.02	**Project Manager**	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	**Project Name**	CopperString 2.0 Project	**EDD Format** ESdat, EQuIS etc	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter
Handed over by	Luke Baxter
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

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Containers Change container type & size if necessary.

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№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	FLR330-BH7_H2 / 0.0 -0.2	23/09/23	S	✖												
2	FLR330-BH7_H2 /0.4 -0.6	23/09/23	S													
3	FLR330-BH7_H2 / 0.8-1.0	23/09/23	S													
4	FLR330-BH7_H2 /1.4 -1.6	23/09/23	S													
5	FLR330-BH9_H2 / 0 - 0.2	24/09/23	S													
6	FLR330-BH9_H2 / 0.4 -0.6	24/09/23	S	✖												
7	FLR330-BH9_H2 / 0.8-1.0	24/09/23	S													
8	FLR330-BH9_H2 / 1.6 -1.6	24/09/23	S													
9																
10																
	Total Counts			2												

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal | Name | Signature | Date | Time

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Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	**Project №**	200446.02	**Project Manager**	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	**Project Name**	CopperString 2.0 Project	**EDD Format** ESdat, EQuIS etc	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Luke Baxter	
Handed over by	Luke Baxter	
Email for Invoice	apinvoices@douglaspartners.com.au	
Email for Results	Dawit.Bekele@douglaspartners.com.au	

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3	FLR330-BH16_H2 / 0.8-1.0	19/09/23	S													
4	FLR330-BH16_H2 /1.4 -1.6	19/09/23	S													
5	FLR500-TP2_H2 / 0-0.2	24/09/23	S													
6	FLR500-TP2_H2 / 0.4 - 0.6	24/09/23	S	✖												
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8	FLR500-TP2_H2 / 1.4-1.6	24/09/23	S													
9																
10																
	Total Counts			2		1										

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	

Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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☐ **Melbourne Laboratory**
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Company	Douglas Partner Pty Ltd	**Project №**	200446.02	**Project Manager**	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	**Project Name**	CopperString 2.0 Project	**EDD Format** ESdat, EQuIS etc	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
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Quote ID №					

Sampler(s)	Luke Baxter
Handed over by	Luke Baxter
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

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☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	FLR500-TP6_H2 / 0.0 - 0.2	20/09/23	S	✖		✖										
2	FLR500-TP6_H2 / 0.4-0.6	20/09/23	S													
3	FLR500-TP6_H2/ 0.8-1.0	20/09/23	S													
4	FLR500-TP6_H2 / 1.4 -1.6	20/09/23	S													
5	FLR500-BH13_H2/0.0-0.2	19/09/23	S													
6	FLR500-BH13_H2/0.4-0.6	19/09/23	S	✖												
7	FLR500-BH13_H2/0.8-1.0	19/09/23	S													
8	FLR500-BH13_H2/1.0-1.6	19/09/23	S													
9																
10																
	Total Counts			2		1										

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal | Name | Signature | Date | Time

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Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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Company	Douglas Partner Pty Ltd	**Project №**	200446.02	**Project Manager**	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	**Project Name**	CopperString 2.0 Project	**EDD Format** ESdat, EQuIS etc	Esdat
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Sampler(s)	Luke Baxter
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Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

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№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	Containers: 500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
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4	FLR500-OTP2_H2 / 1.4-1.6	19/09/23	S													
5	Trip blank and trip spike	24/09/23	S				✖									
6	R1 / 0.4 - 0.6	19/09/23			✖											
7	R2															
8	S2															
9																
10																
	Total Counts			1	1		1									

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Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal Name Signature Date Time

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Company	Douglas Partner Pty Ltd	**Project №**	200446.02	**Project Manager**	Dawit Bekele	**Sampler(s)**	Luke Baxter
Address	439 Montague Road, West End Qld 4101	**Project Name**	CopperString 2.0 Project	**EDD Format** ESdat, EQuIS etc	Esdat	**Handed over by**	Luke Baxter
Contact Name	Dawit Bekele					**Email for Invoice**	apinvoices@douglaspartners.com.au
Phone №	0499 289 560					**Email for Results**	Dawit.Bekele@douglaspartners.com.au
Special Directions							
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☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
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3	FLR500-TP5_H2 / 0.8-1.0	20/09/23	S													
4	FLR500-TP5_H2 / 1.4-1.6	20/09/23	S													
5																
6																
7																
8																
9																
10																
			Total Counts	1												

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

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www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd

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NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

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IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	Douglas Partners (Qld) Pty Ltd
Contact name:	Dawit Bekele
Project name:	COPPERSTRING 2.0 PROJECT
Project ID:	200466.02
Turnaround time:	5 Day
Date/Time received	Oct 11, 2023 11:00 AM
Eurofins reference	1033622

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✓	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Please note: Additional sample S2, samples have been placed on hold.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Zoe Flynn on phone : or by email: ZoeFlynn@eurofins.com

Results will be delivered electronically via email to Dawit Bekele - Dawit.Bekele@douglaspartners.com.au.

Note: A copy of these results will also be delivered to the general Douglas Partners (Qld) Pty Ltd email address.

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
West End
QLD 4101

Project Name: COPPERSTRING 2.0 PROJECT
Project ID: 200466.02

Order No.:
Report #: 1033622
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Oct 11, 2023 11:00 AM
Due: Oct 18, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X	X	X	X	X
External Laboratory						X										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	FLR330-BH7_H2/0.0-0.2	Sep 23, 2023		Soil	B23-Oc0022673				X		X			X		
2	FLR330-BH9_H2/0.4-0.6	Sep 24, 2023		Soil	B23-Oc0022674				X		X			X		
3	FLR330-BH16_H2/0.0-0.2	Sep 19, 2023		Soil	B23-Oc0022675	X		X		X			X			
4	FLR330-TP2_H2/0.4-0.6	Sep 24, 2023		Soil	B23-Oc0022676				X		X			X		
5	FLR330-TP6_H2/0.0-0.2	Sep 20, 2023		Soil	B23-Oc0022677	X		X		X			X			

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X	X	X	X	X
6	FLR330-BH13_H2/0.4-0.6	Sep 19, 2023		Soil	B23-Oc0022678				X		X			X		
7	FLR330-OTP2_H2/0.0-0.2	Sep 19, 2023		Soil	B23-Oc0022679				X		X			X		
8	TRIP BLANK	Sep 24, 2023		Solid	B23-Oc0022680						X				X	
9	TRIP SPIKE	Sep 24, 2023		Trip Spike (solid)	B23-Oc0022681											X
10	R1/0.4-0.6	Sep 19, 2023		Soil	B23-Oc0022682						X	X				
11	FLR330-BH7_H2/0.4-0.6	Sep 23, 2023		Soil	B23-Oc0022683		X									
12	FLR330-BH7_H2/0.8-1.0	Sep 23, 2023		Soil	B23-Oc0022684		X									
13	FLR330-BH7_H2/1.4-	Sep 23, 2023		Soil	B23-Oc0022685		X									

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X	X	X	X	X
	1.6															
14	FLR330-BH9_H2/0.0-0.2	Sep 24, 2023		Soil	B23-Oc0022686		X									
15	FLR330-BH9_H2/0.8-1.0	Sep 24, 2023		Soil	B23-Oc0022687		X									
16	FLR330-BH9_H2/1.4-1.6	Sep 24, 2023		Soil	B23-Oc0022688		X									
17	FLR330-BH16_H2/0.4-0.6	Sep 19, 2023		Soil	B23-Oc0022689		X									
18	FLR330-BH16_H2/0.8-1.0	Sep 19, 2023		Soil	B23-Oc0022690		X									
19	FLR330-BH16_H2/1.4-1.6	Sep 19, 2023		Soil	B23-Oc0022691		X									

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Project ID: 200466.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X	X	X	X	X
20	FLR330-TP2_H2/0.0-0.2	Sep 24, 2023		Soil	B23-Oc0022692		X									
21	FLR330-TP2_H2/0.8-1.0	Sep 24, 2023		Soil	B23-Oc0022693		X									
22	FLR330-TP2_H2/1.4-1.6	Sep 24, 2023		Soil	B23-Oc0022694		X									
23	FLR330-TP6_H2/0.4-0.6	Sep 20, 2023		Soil	B23-Oc0022695		X									
24	FLR330-TP6_H2/0.8-1.0	Sep 20, 2023		Soil	B23-Oc0022696		X									
25	FLR330-TP6_H2/1.4-1.6	Sep 20, 2023		Soil	B23-Oc0022697		X									
26	FLR330-	Sep 19, 2023		Soil	B23-Oc0022698		X									

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X	X	X	X	X
26	FLR330-BH13_H2/0.0-0.2	Sep 19, 2023		Soil	B23-Oc0022698											
27	FLR330-BH13_H2/0.8-1.0	Sep 19, 2023		Soil	B23-Oc0022699		X									
28	FLR330-BH13_H2/1.4-1.6	Sep 19, 2023		Soil	B23-Oc0022700		X									
29	FLR330-OTP2_H2/0.4-0.6	Sep 19, 2023		Soil	B23-Oc0022701		X									
30	FLR330-OTP2_H2/0.8-1.0	Sep 19, 2023		Soil	B23-Oc0022702		X									
31	FLR330-OTP2_H2/1.4-1.6	Sep 19, 2023		Soil	B23-Oc0022703		X									
32	R2	Not Provided		Soil	B23-Oc0022704		X									

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Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X	X	X	X	X
33	S2	Not Provided		Soil	B23-Oc0022705		X									
34	S1	Not Provided		Soil	B23-Oc0022707		X									
35	FLR330-TP5_H2/0.0-0.2	Sep 23, 2023		Soil	B23-Oc0022886		X									
36	FLR330-TP5_H2/0.4-0.6	Sep 23, 2023		Soil	B23-Oc0022887				X		X			X		
37	FLR330-TP5_H2/0.8-1.0	Sep 23, 2023		Soil	B23-Oc0022888		X									
38	FLR330-TP5_H2/1.4-1.6	Sep 23, 2023		Soil	B23-Oc0022889		X									
Test Counts						2	27	8	8	10	10	1	8	8	1	1

Douglas Partners Pty Ltd
439 Montague Road
West End
QLD 4101

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Dawit Bekele**

Report **1033622-S**
Project name COPPERSTRING 2.0 PROJECT
Project ID 200466.02
Received Date Oct 11, 2023

Client Sample ID			**FLR330-BH7_H2/0.0-0.2**	**FLR330-BH9_H2/0.4-0.6**	**FLR330-BH16_H2/0.0-0.2**	**FLR330-TP2_H2/0.4-0.6**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0022673**	**B23-Oc0022674**	**B23-Oc0022675**	**B23-Oc0022676**
Date Sampled			**Sep 23, 2023**	**Sep 24, 2023**	**Sep 19, 2023**	**Sep 24, 2023**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	131	135	81	127
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			FLR330-BH7_H2/0.0-0.2	FLR330-BH9_H2/0.4-0.6	FLR330-BH16_H2/0.0-0.2	FLR330-TP2_H2/0.4-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0022673	B23-Oc0022674	B23-Oc0022675	B23-Oc0022676
Date Sampled			Sep 23, 2023	Sep 24, 2023	Sep 19, 2023	Sep 24, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	90	84	62	84
p-Terphenyl-d14 (surr.)	1	%	96	93	55	88
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	0.07	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	n/a	n/a	< 0.5	n/a
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	67	56	98	79
Tetrachloro-m-xylene (surr.)	1	%	59	57	53	95
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			FLR330-BH7_H2/0.0-0.2	FLR330-BH9_H2/0.4-0.6	FLR330-BH16_H2/0.0-0.2	FLR330-TP2_H2/0.4-0.6
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0022673**	**B23-Oc0022674**	**B23-Oc0022675**	**B23-Oc0022676**
Date Sampled			**Sep 23, 2023**	**Sep 24, 2023**	**Sep 19, 2023**	**Sep 24, 2023**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	65	84	55	66
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	67	56	98	79
Tetrachloro-m-xylene (surr.)	1	%	59	57	53	95
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1

Client Sample ID			FLR330-BH7_H2/0.0-0.2	FLR330-BH9_H2/0.4-0.6	FLR330-BH16_H2/0.0-0.2	FLR330-TP2_H2/0.4-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-Oc0022673	B23-Oc0022674	B23-Oc0022675	B23-Oc0022676
Date Sampled			Sep 23, 2023	Sep 24, 2023	Sep 19, 2023	Sep 24, 2023
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Nitrophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol-d6 (surr.)	1	%	77	68	67	66
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	6.0	10	8.0	4.9
Cadmium	0.5	mg/kg	< 0.5	< 0.5	< 0.4	< 0.5
Chromium	5	mg/kg	26	33	33	27
Copper	5	mg/kg	28	33	34	24
Lead	5	mg/kg	14	15	15	13
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	21	25	29	21
Zinc	5	mg/kg	80	97	88	72
Sample Properties						
% Moisture	1	%	5.3	15	3.0	16
Crystalline Silica			-	-	See Attached	-

Client Sample ID			FLR330-TP6_H2/0.0-0.2	FLR330-BH13_H2/0.4-0.6	FLR330-OTP2_H2/0.0-0.2	TRIP BLANK
Sample Matrix			Soil	Soil	Soil	Trip Blank (solid)
Eurofins Sample No.			B23-Oc0022677	B23-Oc0022678	B23-Oc0022679	B23-Oc0022680
Date Sampled			Sep 20, 2023	Sep 19, 2023	Sep 19, 2023	Sep 24, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	-
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	-
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	-
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	-

Client Sample ID			FLR330-TP6_H2/0.0-0.2	FLR330-BH13_H2/0.4-0.6	FLR330-OTP2_H2/0.0-0.2	TRIP BLANK
Sample Matrix			**Soil**	**Soil**	**Soil**	**Trip Blank (solid)**
Eurofins Sample No.			**B23-Oc0022677**	**B23-Oc0022678**	**B23-Oc0022679**	**B23-Oc0022680**
Date Sampled			**Sep 20, 2023**	**Sep 19, 2023**	**Sep 19, 2023**	**Sep 24, 2023**
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	82	127	135	87
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	-
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	80	82	91	-
p-Terphenyl-d14 (surr.)	1	%	74	90	89	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-

Client Sample ID			FLR330-TP6_H2/0.0-0.2	FLR330-BH13_H2/0.4-0.6	FLR330-OTP2_H2/0.0-0.2	TRIP BLANK
Sample Matrix			**Soil**	**Soil**	**Soil**	**Trip Blank (solid)**
Eurofins Sample No.			**B23-Oc0022677**	**B23-Oc0022678**	**B23-Oc0022679**	**B23-Oc0022680**
Date Sampled			**Sep 20, 2023**	**Sep 19, 2023**	**Sep 19, 2023**	**Sep 24, 2023**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Toxaphene	0.5	mg/kg	< 0.5	-	n/a	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	73	69	88	-
Tetrachloro-m-xylene (surr.)	1	%	79	81	88	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Coumaphos	2	mg/kg	< 2	< 2	< 2	-
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Monocrotophos	2	mg/kg	< 2	< 2	< 2	-
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Omethoate	2	mg/kg	< 2	< 2	< 2	-
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-

Client Sample ID			FLR330-TP6_H2/0.0-0.2	FLR330-BH13_H2/0.4-0.6	FLR330-OTP2_H2/0.0-0.2	TRIP BLANK
Sample Matrix			Soil	Soil	Soil	Trip Blank (solid)
Eurofins Sample No.			B23-Oc0022677	B23-Oc0022678	B23-Oc0022679	B23-Oc0022680
Date Sampled			Sep 20, 2023	Sep 19, 2023	Sep 19, 2023	Sep 24, 2023
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Triphenylphosphate (surr.)	1	%	86	72	58	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	73	69	88	-
Tetrachloro-m-xylene (surr.)	1	%	79	81	88	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	-
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	-
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	-
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	-
2-Nitrophenol	1.0	mg/kg	< 1	< 1	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	-
Dinoseb	20	mg/kg	< 20	< 20	< 20	-
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Phenol-d6 (surr.)	1	%	97	68	72	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	-
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	-

Client Sample ID			FLR330-TP6_H2/0.0-0.2	FLR330-BH13_H2/0.4-0.6	FLR330-OTP2_H2/0.0-0.2	TRIP BLANK
Sample Matrix			**Soil**	**Soil**	**Soil**	**Trip Blank (solid)**
Eurofins Sample No.			**B23-Oc0022677**	**B23-Oc0022678**	**B23-Oc0022679**	**B23-Oc0022680**
Date Sampled			**Sep 20, 2023**	**Sep 19, 2023**	**Sep 19, 2023**	**Sep 24, 2023**
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	6.0	6.8	6.6	-
Cadmium	0.4	mg/kg	< 0.4	< 0.5	< 0.5	-
Chromium	5	mg/kg	29	36	32	-
Copper	5	mg/kg	26	29	26	-
Lead	5	mg/kg	14	14	15	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Nickel	5	mg/kg	24	25	21	-
Zinc	5	mg/kg	76	84	77	-
Sample Properties						
% Moisture	1	%	5.2	14	5.0	-
Crystalline Silica			See Attached	-	-	-
Naphthalene[N02]	0.5	mg/kg	-	-	-	< 0.5
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	-	< 20
Total Recoverable Hydrocarbons						
TRH C6-C10	20	mg/kg	-	-	-	< 20

Client Sample ID			TRIP SPIKE	R1/0.4-0.6	FLR330-TP5_H2/0.4-0.6
Sample Matrix			**Trip Spike (solid)**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Oc0022681**	**B23-Oc0022682**	**B23-Oc0022887**
Date Sampled			**Sep 24, 2023**	**Sep 19, 2023**	**Sep 23, 2023**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	-	< 20	< 20
TRH C10-C14	20	mg/kg	-	< 20	< 20
TRH C15-C28	50	mg/kg	-	< 50	< 50
TRH C29-C36	50	mg/kg	-	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	-	< 50	< 50
BTEX					
Benzene	0.1	mg/kg	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	129	81
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	< 50
TRH C6-C10	20	mg/kg	-	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	< 20

Client Sample ID			TRIP SPIKE	R1/0.4-0.6	FLR330-TP5_H2/0.4-0.6
Sample Matrix			Trip Spike (solid)	Soil	Soil
Eurofins Sample No.			B23-Oc0022681	B23-Oc0022682	B23-Oc0022887
Date Sampled			Sep 24, 2023	Sep 19, 2023	Sep 23, 2023
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	90	64
p-Terphenyl-d14 (surr.)	1	%	-	88	66
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	< 0.05
a-HCH	0.05	mg/kg	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	< 0.05
b-HCH	0.05	mg/kg	-	-	< 0.05
d-HCH	0.05	mg/kg	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	< 0.05
Toxaphene	0.5	mg/kg	-	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	< 0.1

Client Sample ID			TRIP SPIKE	R1/0.4-0.6	FLR330-TP5_H2/0.4-0.6
Sample Matrix			Trip Spike (solid)	Soil	Soil
Eurofins Sample No.			B23-Oc0022681	B23-Oc0022682	B23-Oc0022887
Date Sampled			Sep 24, 2023	Sep 19, 2023	Sep 23, 2023
Test/Reference	LOR	Unit			
Organochlorine Pesticides					
Dibutylchlorendate (surr.)	1	%	-	-	
Tetrachloro-m-xylene (surr.)	1	%	-	-	
Organophosphorus Pesticides					
Azinphos-methyl	0.2	mg/kg	-	-	< 0.2
Bolstar	0.2	mg/kg	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	-	< 0.2
Coumaphos	2	mg/kg	-	-	< 2
Demeton-S	0.2	mg/kg	-	-	< 0.2
Demeton-O	0.2	mg/kg	-	-	< 0.2
Diazinon	0.2	mg/kg	-	-	< 0.2
Dichlorvos	0.2	mg/kg	-	-	< 0.2
Dimethoate	0.2	mg/kg	-	-	< 0.2
Disulfoton	0.2	mg/kg	-	-	< 0.2
EPN	0.2	mg/kg	-	-	< 0.2
Ethion	0.2	mg/kg	-	-	< 0.2
Ethoprop	0.2	mg/kg	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	-	-	< 0.2
Fenitrothion	0.2	mg/kg	-	-	< 0.2
Fensulfothion	0.2	mg/kg	-	-	< 0.2
Fenthion	0.2	mg/kg	-	-	< 0.2
Malathion	0.2	mg/kg	-	-	< 0.2
Merphos	0.2	mg/kg	-	-	< 0.2
Methyl parathion	0.2	mg/kg	-	-	< 0.2
Mevinphos	0.2	mg/kg	-	-	< 0.2
Monocrotophos	2	mg/kg	-	-	< 2
Naled	0.2	mg/kg	-	-	< 0.2
Omethoate	2	mg/kg	-	-	< 2
Phorate	0.2	mg/kg	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	-	< 0.2
Pyrazophos	0.2	mg/kg	-	-	< 0.2
Ronnel	0.2	mg/kg	-	-	< 0.2
Terbufos	0.2	mg/kg	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	-	< 0.2
Tokuthion	0.2	mg/kg	-	-	< 0.2
Trichloronate	0.2	mg/kg	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	-	-	55
Polychlorinated Biphenyls					
Aroclor-1016	0.1	mg/kg	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	-	< 0.1
Total PCB*	0.1	mg/kg	-	-	< 0.1

Client Sample ID			TRIP SPIKE	R1/0.4-0.6	FLR330-TP5_H2/0.4-0.6
Sample Matrix			Trip Spike (solid)	Soil	Soil
Eurofins Sample No.			B23-Oc0022681	B23-Oc0022682	B23-Oc0022887
Date Sampled			Sep 24, 2023	Sep 19, 2023	Sep 23, 2023
Test/Reference	LOR	Unit			
Polychlorinated Biphenyls					
Dibutylchlorendate (surr.)	1	%	-	-	
Tetrachloro-m-xylene (surr.)	1	%	-	-	
Phenols (Halogenated)					
2-Chlorophenol	0.5	mg/kg	-	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	-	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	-	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	-	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	-	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	-	-	< 1
Pentachlorophenol	1	mg/kg	-	-	< 1
Tetrachlorophenols - Total	10	mg/kg	-	-	< 10
Total Halogenated Phenol*	1	mg/kg	-	-	< 1
Phenols (non-Halogenated)					
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	< 5
2-Nitrophenol	1.0	mg/kg	-	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	-	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4
Total cresols*	0.5	mg/kg	-	-	< 0.5
4-Nitrophenol	5	mg/kg	-	-	< 5
Dinoseb	20	mg/kg	-	-	< 20
Phenol	0.5	mg/kg	-	-	< 0.5
Phenol-d6 (surr.)	1	%	-	-	53
Total Non-Halogenated Phenol*	20	mg/kg	-	-	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16	50	mg/kg	-	< 50	< 50
TRH >C16-C34	100	mg/kg	-	< 100	< 100
TRH >C34-C40	100	mg/kg	-	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	< 100
Heavy Metals					
Arsenic	2	mg/kg	-	6.7	7.2
Cadmium	0.5	mg/kg	-	< 0.5	< 0.5
Chromium	5	mg/kg	-	32	36
Copper	5	mg/kg	-	26	30
Lead	5	mg/kg	-	13	17
Mercury	0.1	mg/kg	-	< 0.1	< 0.1
Nickel	5	mg/kg	-	22	27
Zinc	5	mg/kg	-	75	86
Sample Properties					
% Moisture	1	%	-	13	14
Naphthalene	1	%	150	-	-
TRH C6-C10	1	%	80	-	-
TRH C6-C9	1	%	73	-	-

Client Sample ID			TRIP SPIKE	R1/0.4-0.6	FLR330-TP5_H2/0.4-0.6
Sample Matrix			Trip Spike (solid)	Soil	Soil
Eurofins Sample No.			B23-Oc0022681	B23-Oc0022682	B23-Oc0022887
Date Sampled			Sep 24, 2023	Sep 19, 2023	Sep 23, 2023
Test/Reference	LOR	Unit			
BTEX					
Benzene	1	%	49	-	-
Ethylbenzene	1	%	69	-	-
m&p-Xylenes	1	%	99	-	-
o-Xylene	1	%	74	-	-
Toluene	1	%	64	-	-
Xylenes - Total	1	%	84	-	-
4-Bromofluorobenzene (surr.)	1	%	119	-	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Brisbane	Oct 17, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Brisbane	Oct 17, 2023	14 Days
- Method: USEPA SW846 8260			
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Brisbane	Oct 17, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Naphthalene	Brisbane	Oct 17, 2023	14 Days
- Method: USEPA 8260B - MGT 350A Volatile Organics by GCMS			
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Total Recoverable Hydrocarbons	Brisbane	Oct 17, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Eurofins Suite B7A			
Polycyclic Aromatic Hydrocarbons	Brisbane	Oct 17, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Brisbane	Oct 17, 2023	14 Days
- Method: USEPA M 8270 (LTM-ORG-2130 PAH & Phenols in Soil & Water by GC-MS)			
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Brisbane	Oct 17, 2023	14 Days
- Method: USEPA M 8270 (LTM-ORG-2130 PAH & Phenols in Soil & Water by GC-MS)			
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Brisbane	Oct 17, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Brisbane	Oct 17, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Brisbane	Oct 17, 2023	14 Days
- Method: LTM-ORG-2220 OCP and PCB in Soil and Water			
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)			
Organophosphorus Pesticides	Brisbane	Oct 17, 2023	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8270)			
Polychlorinated Biphenyls	Melbourne	Oct 16, 2023	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)			
% Moisture	Brisbane	Oct 13, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Crystalline Silica	Melbourne	Oct 11, 2023	10 Days
- Method:			

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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QLD 4101

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Project ID: 200466.02

Order No.:
Report #: 1033622
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Fax: 07 3237 8999

Received: Oct 11, 2023 11:00 AM
Due: Oct 18, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Eurofins Suite B15	Moisture Set	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	Eurofins Suite B7A	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X	X	X	X	X
External Laboratory						X										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	FLR330-BH7_H2/0.0-0.2	Sep 23, 2023		Soil	B23-Oc0022673				X		X			X		
2	FLR330-BH9_H2/0.4-0.6	Sep 24, 2023		Soil	B23-Oc0022674				X		X			X		
3	FLR330-BH16_H2/0.0-0.2	Sep 19, 2023		Soil	B23-Oc0022675	X		X		X			X			
4	FLR330-TP2_H2/0.4-0.6	Sep 24, 2023		Soil	B23-Oc0022676				X		X			X		
5	FLR330-TP6_H2/0.0-0.2	Sep 20, 2023		Soil	B23-Oc0022677	X		X		X			X			

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Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X	X	X	X	X
6	FLR330-BH13_H2/0.4-0.6	Sep 19, 2023		Soil	B23-Oc0022678				X		X			X		
7	FLR330-OTP2_H2/0.0-0.2	Sep 19, 2023		Soil	B23-Oc0022679				X		X			X		
8	TRIP BLANK	Sep 24, 2023		Solid	B23-Oc0022680						X				X	
9	TRIP SPIKE	Sep 24, 2023		Trip Spike (solid)	B23-Oc0022681											X
10	R1/0.4-0.6	Sep 19, 2023		Soil	B23-Oc0022682						X	X				
11	FLR330-BH7_H2/0.4-0.6	Sep 23, 2023		Soil	B23-Oc0022683		X									
12	FLR330-BH7_H2/0.8-1.0	Sep 23, 2023		Soil	B23-Oc0022684		X									
13	FLR330-BH7_H2/1.4-	Sep 23, 2023		Soil	B23-Oc0022685		X									

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Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X	X	X	X	X
	1.6															
14	FLR330-BH9_H2/0.0-0.2	Sep 24, 2023		Soil	B23-Oc0022686		X									
15	FLR330-BH9_H2/0.8-1.0	Sep 24, 2023		Soil	B23-Oc0022687		X									
16	FLR330-BH9_H2/1.4-1.6	Sep 24, 2023		Soil	B23-Oc0022688		X									
17	FLR330-BH16_H2/0.4-0.6	Sep 19, 2023		Soil	B23-Oc0022689		X									
18	FLR330-BH16_H2/0.8-1.0	Sep 19, 2023		Soil	B23-Oc0022690		X									
19	FLR330-BH16_H2/1.4-1.6	Sep 19, 2023		Soil	B23-Oc0022691		X									

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Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X	X	X	X	X
20	FLR330-TP2_H2/0.0-0.2	Sep 24, 2023		Soil	B23-Oc0022692		X									
21	FLR330-TP2_H2/0.8-1.0	Sep 24, 2023		Soil	B23-Oc0022693		X									
22	FLR330-TP2_H2/1.4-1.6	Sep 24, 2023		Soil	B23-Oc0022694		X									
23	FLR330-TP6_H2/0.4-0.6	Sep 20, 2023		Soil	B23-Oc0022695		X									
24	FLR330-TP6_H2/0.8-1.0	Sep 20, 2023		Soil	B23-Oc0022696		X									
25	FLR330-TP6_H2/1.4-1.6	Sep 20, 2023		Soil	B23-Oc0022697		X									
26	FLR330-	Sep 19, 2023		Soil	B23-Oc0022698		X									

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Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X	X	X	X	X
26	FLR330-BH13_H2/0.0-0.2	Sep 19, 2023		Soil	B23-Oc0022698											
27	FLR330-BH13_H2/0.8-1.0	Sep 19, 2023		Soil	B23-Oc0022699		X									
28	FLR330-BH13_H2/1.4-1.6	Sep 19, 2023		Soil	B23-Oc0022700		X									
29	FLR330-OTP2_H2/0.4-0.6	Sep 19, 2023		Soil	B23-Oc0022701		X									
30	FLR330-OTP2_H2/0.8-1.0	Sep 19, 2023		Soil	B23-Oc0022702		X									
31	FLR330-OTP2_H2/1.4-1.6	Sep 19, 2023		Soil	B23-Oc0022703		X									
32	R2	Not Provided		Soil	B23-Oc0022704		X									

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Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X	X	X	X	X
33	S2	Not Provided		Soil	B23-Oc0022705		X									
34	S1	Not Provided		Soil	B23-Oc0022707		X									
35	FLR330-TP5_H2/0.0-0.2	Sep 23, 2023		Soil	B23-Oc0022886		X									
36	FLR330-TP5_H2/0.4-0.6	Sep 23, 2023		Soil	B23-Oc0022887				X		X			X		
37	FLR330-TP5_H2/0.8-1.0	Sep 23, 2023		Soil	B23-Oc0022888		X									
38	FLR330-TP5_H2/1.4-1.6	Sep 23, 2023		Soil	B23-Oc0022889		X									
Test Counts						2	27	8	8	10	10	1	8	8	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**µg/L:** micrograms per litre
ppm: parts per million	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	n/a			0.5	N/A	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 10			10	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.5			0.5	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	112			70-130	Pass	
TRH C10-C14	%	83			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	106			70-130	Pass	
Toluene	%	98			70-130	Pass	
Ethylbenzene	%	107			70-130	Pass	
m&p-Xylenes	%	108			70-130	Pass	
Xylenes - Total*	%	108			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	%	113			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	79			70-130	Pass	
Acenaphthylene	%	74			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Anthracene	%	76			70-130	Pass	
Benz(a)anthracene	%	95			70-130	Pass	
Benzo(a)pyrene	%	80			70-130	Pass	
Benzo(b&j)fluoranthene	%	92			70-130	Pass	
Benzo(g.h.i)perylene	%	70			70-130	Pass	
Benzo(k)fluoranthene	%	87			70-130	Pass	
Chrysene	%	87			70-130	Pass	
Dibenz(a.h)anthracene	%	74			70-130	Pass	
Fluoranthene	%	71			70-130	Pass	
Fluorene	%	72			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	73			70-130	Pass	
Naphthalene	%	78			70-130	Pass	
Phenanthrene	%	108			70-130	Pass	
Pyrene	%	71			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	84			70-130	Pass	
4.4'-DDD	%	96			70-130	Pass	
4.4'-DDE	%	122			70-130	Pass	
4.4'-DDT	%	73			70-130	Pass	
a-HCH	%	73			70-130	Pass	
Aldrin	%	72			70-130	Pass	
b-HCH	%	85			70-130	Pass	
d-HCH	%	112			70-130	Pass	
Dieldrin	%	83			70-130	Pass	
Endosulfan I	%	74			70-130	Pass	
Endosulfan II	%	85			70-130	Pass	
Endosulfan sulphate	%	75			70-130	Pass	
Endrin	%	97			70-130	Pass	
Endrin aldehyde	%	70			70-130	Pass	
Endrin ketone	%	76			70-130	Pass	
g-HCH (Lindane)	%	72			70-130	Pass	
Heptachlor	%	72			70-130	Pass	
Heptachlor epoxide	%	80			70-130	Pass	
Hexachlorobenzene	%	98			70-130	Pass	
Methoxychlor	%	74			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Azinphos-methyl	%	80			70-130	Pass	
Bolstar	%	70			70-130	Pass	
Chlorfenvinphos	%	119			70-130	Pass	
Chlorpyrifos	%	74			70-130	Pass	
Chlorpyrifos-methyl	%	80			70-130	Pass	
Coumaphos	%	95			70-130	Pass	
Demeton-S	%	81			70-130	Pass	
Demeton-O	%	120			70-130	Pass	
Diazinon	%	75			70-130	Pass	
Dichlorvos	%	75			70-130	Pass	
Dimethoate	%	104			70-130	Pass	
Disulfoton	%	96			70-130	Pass	
EPN	%	96			70-130	Pass	
Ethion	%	80			70-130	Pass	
Ethoprop	%	119			70-130	Pass	
Ethyl parathion	%	78			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fenitrothion	%	91			70-130	Pass	
Fensulfothion	%	101			70-130	Pass	
Fenthion	%	102			70-130	Pass	
Malathion	%	70			70-130	Pass	
Merphos	%	81			70-130	Pass	
Methyl parathion	%	91			75-125	Pass	
Mevinphos	%	120			70-130	Pass	
Monocrotophos	%	105			70-130	Pass	
Naled	%	77			70-130	Pass	
Omethoate	%	72			70-130	Pass	
Phorate	%	96			70-130	Pass	
Pirimiphos-methyl	%	117			70-130	Pass	
Pyrazophos	%	118			70-130	Pass	
Ronnel	%	113			70-130	Pass	
Terbufos	%	71			70-130	Pass	
Tetrachlorvinphos	%	118			70-130	Pass	
Tokuthion	%	86			70-130	Pass	
Trichloronate	%	72			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	97			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	82			25-140	Pass	
2.4-Dichlorophenol	%	61			25-140	Pass	
2.4.5-Trichlorophenol	%	25			25-140	Pass	
2.4.6-Trichlorophenol	%	45			25-140	Pass	
2.6-Dichlorophenol	%	69			25-140	Pass	
4-Chloro-3-methylphenol	%	64			25-140	Pass	
Pentachlorophenol	%	32			25-140	Pass	
Tetrachlorophenols - Total	%	38			25-140	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	26			25-140	Pass	
2-Methyl-4.6-dinitrophenol	%	25			25-140	Pass	
2-Nitrophenol	%	83			25-140	Pass	
2.4-Dimethylphenol	%	66			25-140	Pass	
2-Methylphenol (o-Cresol)	%	81			25-140	Pass	
3&4-Methylphenol (m&p-Cresol)	%	75			25-140	Pass	
4-Nitrophenol	%	49			25-140	Pass	
Dinoseb	%	52			25-140	Pass	
Phenol	%	76			25-140	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	83			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	93			80-120	Pass	
Cadmium	%	101			80-120	Pass	
Chromium	%	94			80-120	Pass	
Copper	%	96			80-120	Pass	
Lead	%	98			80-120	Pass	
Mercury	%	91			80-120	Pass	
Nickel	%	91			80-120	Pass	
Zinc	%	101			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	B23-Oc0033681	NCP	%	71			70-130	Pass	
Acenaphthylene	B23-Oc0033681	NCP	%	74			70-130	Pass	
Anthracene	B23-Oc0036342	NCP	%	75			70-130	Pass	
Benz(a)anthracene	B23-Oc0033681	NCP	%	71			70-130	Pass	
Benzo(a)pyrene	B23-Oc0033681	NCP	%	74			70-130	Pass	
Benzo(b&j)fluoranthene	B23-Oc0033681	NCP	%	77			70-130	Pass	
Benzo(g.h.i)perylene	B23-Oc0036399	NCP	%	77			70-130	Pass	
Benzo(k)fluoranthene	B23-Oc0033681	NCP	%	74			70-130	Pass	
Chrysene	B23-Oc0036399	NCP	%	72			70-130	Pass	
Dibenz(a.h)anthracene	B23-Oc0033681	NCP	%	81			70-130	Pass	
Fluoranthene	B23-Oc0036342	NCP	%	84			70-130	Pass	
Fluorene	B23-Oc0036399	NCP	%	73			70-130	Pass	
Indeno(1.2.3-cd)pyrene	B23-Oc0033681	NCP	%	78			70-130	Pass	
Naphthalene	B23-Oc0033681	NCP	%	72			70-130	Pass	
Phenanthrene	B23-Oc0016192	NCP	%	77			70-130	Pass	
Pyrene	B23-Oc0036342	NCP	%	75			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	B23-Oc0033681	NCP	%	76			70-130	Pass	
4.4'-DDD	B23-Oc0007277	NCP	%	71			70-130	Pass	
4.4'-DDE	B23-Oc0033681	NCP	%	72			70-130	Pass	
4.4'-DDT	B23-Oc0033681	NCP	%	73			70-130	Pass	
a-HCH	B23-Oc0033681	NCP	%	70			70-130	Pass	
Aldrin	B23-Oc0016795	NCP	%	73			70-130	Pass	
b-HCH	B23-Oc0033681	NCP	%	78			70-130	Pass	
d-HCH	B23-Oc0016795	NCP	%	73			70-130	Pass	
Dieldrin	B23-Oc0033681	NCP	%	90			70-130	Pass	
Endosulfan I	B23-Oc0018124	NCP	%	71			70-130	Pass	
Endosulfan II	B23-Oc0033681	NCP	%	77			70-130	Pass	
Endosulfan sulphate	B23-Oc0016795	NCP	%	79			70-130	Pass	
Endrin	B23-Oc0016795	NCP	%	99			70-130	Pass	
Endrin aldehyde	B23-Oc0016795	NCP	%	79			70-130	Pass	
Endrin ketone	B23-Oc0016795	NCP	%	73			70-130	Pass	
g-HCH (Lindane)	B23-Oc0016795	NCP	%	78			70-130	Pass	
Heptachlor	B23-Oc0033681	NCP	%	73			70-130	Pass	
Heptachlor epoxide	B23-Oc0033681	NCP	%	81			70-130	Pass	
Hexachlorobenzene	B23-Oc0033681	NCP	%	92			70-130	Pass	
Methoxychlor	B23-Oc0033681	NCP	%	72			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Azinphos-methyl	B23-Oc0016795	NCP	%	110			70-130	Pass	
Bolstar	B23-Oc0016192	NCP	%	89			70-130	Pass	
Chlorfenvinphos	B23-Oc0016795	NCP	%	104			70-130	Pass	
Chlorpyrifos	B23-Oc0016795	NCP	%	77			70-130	Pass	
Chlorpyrifos-methyl	B23-Oc0016795	NCP	%	93			70-130	Pass	
Coumaphos	B23-Oc0016795	NCP	%	102			70-130	Pass	
Demeton-S	B23-Oc0033681	NCP	%	91			70-130	Pass	
Demeton-O	B23-Oc0016795	NCP	%	76			70-130	Pass	
Diazinon	B23-Oc0016795	NCP	%	75			70-130	Pass	
Dichlorvos	B23-Oc0016795	NCP	%	87			70-130	Pass	
Dimethoate	B23-Oc0033681	NCP	%	108			70-130	Pass	
Disulfoton	B23-Oc0033681	NCP	%	98			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Ethion	B23-Oc0008366	NCP	%	77			70-130	Pass	
Ethoprop	B23-Oc0016795	NCP	%	78			70-130	Pass	
Ethyl parathion	B23-Oc0033681	NCP	%	112			70-130	Pass	
Fenitrothion	B23-Oc0016795	NCP	%	88			70-130	Pass	
Fensulfothion	B23-Oc0018124	NCP	%	120			70-130	Pass	
Fenthion	B23-Oc0033681	NCP	%	107			70-130	Pass	
Malathion	B23-Oc0033681	NCP	%	126			70-130	Pass	
Methyl parathion	B23-Oc0016795	NCP	%	86			70-130	Pass	
Mevinphos	B23-Oc0033681	NCP	%	104			70-130	Pass	
Monocrotophos	B23-Oc0033681	NCP	%	72			70-130	Pass	
Phorate	B23-Oc0018124	NCP	%	98			70-130	Pass	
Pirimiphos-methyl	B23-Oc0016795	NCP	%	83			70-130	Pass	
Pyrazophos	B23-Oc0016795	NCP	%	106			70-130	Pass	
Ronnel	B23-Oc0033681	NCP	%	106			70-130	Pass	
Terbufos	B23-Oc0016795	NCP	%	88			70-130	Pass	
Tetrachlorvinphos	B23-Oc0033681	NCP	%	114			70-130	Pass	
Tokuthion	B23-Oc0018124	NCP	%	91			70-130	Pass	
Trichloronate	B23-Oc0016795	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	B23-Oc0033681	NCP	%	78			30-130	Pass	
2.4-Dichlorophenol	B23-Oc0033681	NCP	%	49			30-130	Pass	
2.4.5-Trichlorophenol	B23-Oc0008366	NCP	%	45			30-130	Pass	
2.6-Dichlorophenol	B23-Oc0033681	NCP	%	67			30-130	Pass	
4-Chloro-3-methylphenol	B23-Oc0033681	NCP	%	56			30-130	Pass	
Pentachlorophenol	B23-Oc0033681	NCP	%	44			30-130	Pass	
Tetrachlorophenols - Total	B23-Oc0033681	NCP	%	42			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	B23-Oc0033681	NCP	%	47			30-130	Pass	
2-Nitrophenol	B23-Oc0033681	NCP	%	87			30-130	Pass	
2.4-Dimethylphenol	B23-Oc0033681	NCP	%	58			30-130	Pass	
2.4-Dinitrophenol	B23-Oc0033681	NCP	%	65			30-130	Pass	
2-Methylphenol (o-Cresol)	B23-Oc0033681	NCP	%	76			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	B23-Oc0033681	NCP	%	70			30-130	Pass	
4-Nitrophenol	B23-Oc0033681	NCP	%	60			30-130	Pass	
Dinoseb	B23-Oc0033681	NCP	%	73			30-130	Pass	
Phenol	B23-Oc0033681	NCP	%	72			30-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Zinc	B23-Oc0025963	NCP	%	102			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	B23-Oc0022674	CP	%	105			70-130	Pass	
TRH C10-C14	B23-Oc0022674	CP	%	83			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	B23-Oc0022674	CP	%	107			70-130	Pass	
Toluene	B23-Oc0022674	CP	%	98			70-130	Pass	
Ethylbenzene	B23-Oc0022674	CP	%	116			70-130	Pass	
m&p-Xylenes	B23-Oc0022674	CP	%	118			70-130	Pass	
o-Xylene	B23-Oc0022674	CP	%	122			70-130	Pass	
Xylenes - Total*	B23-Oc0022674	CP	%	119			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	B23-Oc0022674	CP	%	105			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	B23-Oc0022674	CP	%	82			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	B23-Oc0022674	CP	%	80			75-125	Pass	
Cadmium	B23-Oc0022674	CP	%	91			75-125	Pass	
Chromium	B23-Oc0022674	CP	%	86			75-125	Pass	
Copper	B23-Oc0022674	CP	%	78			75-125	Pass	
Lead	B23-Oc0022674	CP	%	86			75-125	Pass	
Mercury	B23-Oc0022674	CP	%	88			75-125	Pass	
Nickel	B23-Oc0022674	CP	%	79			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	B23-Oc0022675	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	B23-Oc0022675	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B23-Oc0022675	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	B23-Oc0022675	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endrin ketone	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	B23-Oc0022675	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	B23-Oc0022675	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	B23-Oc0022675	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	B23-Oc0022675	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	B23-Oc0022675	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	B23-Oc0022675	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	B23-Oc0022675	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	B23-Oc0022675	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	B23-Oc0022675	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	B23-Oc0022675	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	B23-Oc0022675	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	B23-Oc0022675	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	B23-Oc0022675	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	B23-Oc0022675	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	B23-Oc0022675	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	B23-Oc0022675	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	B23-Oc0022675	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	B23-Oc0022675	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	B23-Oc0022675	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Nitrophenol	B23-Oc0022675	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	B23-Oc0022675	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	B23-Oc0022675	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	B23-Oc0022675	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	B23-Oc0022675	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	B23-Oc0022675	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	B23-Oc0022675	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B23-Oc0022675	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B23-Oc0022675	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B23-Oc0022675	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B23-Oc0022677	CP	mg/kg	6.0	6.1	<1	30%	Pass	
Cadmium	B23-Oc0022677	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	B23-Oc0022677	CP	mg/kg	29	29	<1	30%	Pass	
Copper	B23-Oc0022677	CP	mg/kg	26	26	1.4	30%	Pass	
Lead	B23-Oc0022677	CP	mg/kg	14	14	1.0	30%	Pass	
Mercury	B23-Oc0022677	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	B23-Oc0022677	CP	mg/kg	24	24	<1	30%	Pass	
Zinc	B23-Oc0022677	CP	mg/kg	76	78	1.9	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B23-Oc0022678	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	B23-Oc0022678	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	B23-Oc0022678	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B23-Oc0022678	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B23-Oc0022678	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B23-Oc0022678	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B23-Oc0022678	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B23-Oc0022678	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	B23-Oc0022678	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	B23-Oc0022678	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B23-Oc0022678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B23-Oc0022678	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B23-Oc0022678	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B23-Oc0022678	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B23-Oc0022678	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B23-Oc0022678	CP	mg/kg	6.8	6.2	9.8	30%	Pass	
Cadmium	B23-Oc0022678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chromium	B23-Oc0022678	CP	mg/kg	36	32	11	30%	Pass	
Copper	B23-Oc0022678	CP	mg/kg	29	26	11	30%	Pass	
Lead	B23-Oc0022678	CP	mg/kg	14	13	10	30%	Pass	
Mercury	B23-Oc0022678	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	B23-Oc0022678	CP	mg/kg	25	23	12	30%	Pass	
Zinc	B23-Oc0022678	CP	mg/kg	84	78	7.3	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B23-Oc0022680	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B23-Oc0022680	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B23-Oc0022680	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B23-Oc0022680	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B23-Oc0022680	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	B23-Oc0022680	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	B23-Oc0022680	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B23-Oc0022680	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B23-Oc0022680	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	B23-Oc0022682	CP	%	13	13	1.5	30%	Pass	

Comments

Analysis of Crystalline Silica has been completed by AGON SA, report reference JL4847-12.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised by:

Zoe Flynn	Analytical Services Manager
Edward Lee	Senior Analyst-Organic
Emily Rosenberg	Senior Analyst-Metal
Harry Bacalis	Senior Analyst-Volatile
Jonathon Angell	Senior Analyst-Metal
Jonathon Angell	Senior Analyst-Organic
Jonathon Angell	Senior Analyst-Sample Properties
Jonathon Angell	Senior Analyst-Volatile
Joseph Edouard	Senior Analyst-Organic
Mary Makarios	Senior Analyst-Sample Properties
Sarah McCallion	Senior Analyst-Organic



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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1016151

CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

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Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	200446.02	EDD Format ESdat, EQuIS etc	
Contact Name	Dawit Bekele				
Phone №	0499289560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Dawit Bekele
Handed over by	
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses: Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers: Change container type & size if necessary.

Required Turnaround Time (TAT): Default will be 5 days if not ticked.

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Respirable total crystalline silica (RCS) - 53710a	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH49/0.2			X							1		
2	BH53/0.2			X							1		
3	BH54/0.2			X							1		
4	BH55/0.2			X							1		
5	BH56/0.2			X							1		
6	BH57/0.2			X							1		
7	BH58/0.2			X							1		
8	BH59/0.2			X							1		
9	BH60/0.2			X							1		
10													
			Total Counts	9							9		

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☑ Postal

Name		Signature		Date		Time					
Eurofins | mgt Laboratory Use Only	Received By	DF	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	[signature]	Date	10/8/23	Time	9am	Temperature	19.3
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

☐ **Sydney Laboratory**
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☑ **Brisbane Laboratory**
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	**Project №**	200446.02	**Project Manager**	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	**Project Name**	200446.02	**EDD Format** ESdat, EQuIS etc	
Contact Name	Dawit Bekele				
Phone №	0499289560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Dawit Bekele
Handed over by	
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Respirable total crystalline silica (RCS) - 53710a	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH62/0.2			X							1		
2	BH65/0.2			X							1		
3	BH66/0.2			X							1		
4													
5													
6													
7													
8													
9													
10													
	Total Counts			3							3		

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☑ Postal	Name		Signature	
Date		Time					

Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Report №

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www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Christchurch	Tauranga
35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	Douglas Partners (Qld) Pty Ltd
Contact name:	Dawit Bekele
Project name:	200446.02
Project ID:	200446.02
Turnaround time:	5 Day
Date/Time received	Aug 10, 2023 9:00 AM
Eurofins reference	1016151

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✗	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✗	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

No sampling dates provided.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Zoe Flynn on phone : or by email: ZoeFlynn@eurofins.com

Results will be delivered electronically via email to Dawit Bekele - Dawit.Bekele@douglaspartners.com.au.

Note: A copy of these results will also be delivered to the general Douglas Partners (Qld) Pty Ltd email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Christchurch	Tauranga
35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
West End
QLD 4101

Project Name: 200446.02
Project ID: 200446.02

Order No.: N/A
Report #: 1016151
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Aug 10, 2023 9:00 AM
Due: Aug 17, 2023
Priority: 5 Day
Contact Name: Dawit Bekele

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica - Total
Perth Laboratory - NATA # 2377 Site # 2370						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	BH49/0.2	Not Provided		Soil	B23-Au0029828	X
2	BH53/0.2	Not Provided		Soil	B23-Au0029829	X
3	BH54/0.2	Not Provided		Soil	B23-Au0029830	X
4	BH55/0.2	Not Provided		Soil	B23-Au0029831	X
5	BH56/0.2	Not Provided		Soil	B23-Au0029832	X
6	BH57/0.2	Not Provided		Soil	B23-Au0029833	X
7	BH58/0.2	Not Provided		Soil	B23-Au0029834	X
8	BH59/0.2	Not Provided		Soil	B23-Au0029835	X
9	BH60/0.2	Not Provided		Soil	B23-Au0029836	X
10	BH62/0.2	Not Provided		Soil	B23-Au0029886	X
11	BH65/0.2	Not Provided		Soil	B23-Au0029887	X
12	BH66/0.2	Not Provided		Soil	B23-Au0029888	X
Test Counts						12

Melbourne Laboratory - H76, 63-85 Turner Street, Port Melbourne, 3207
Darwin Laboratory - 1/41 Jessop Crescent, Berrimah, NT 0828
Adelaide Laboratory - 3/224 Glen Osmond Road, Fullarton, SA 5063
Agon Environmental Pty Ltd ABN 29 167 746 063
admin@agonenviro.com.au (08) 8338 1009
www.agonenviro.com.au

Mineral Identification Report: JL4827-6

CLIENT:	Eurofins	**CLIENT CONTACT:**	07 3902 4600
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**RECEIVED IN LAB:**	14 August 2023
PROJECT:	1016151	**DATES ANALYSED:**	15 August 2023
ATTENTION:	Alana Wadsworth		

PROCEDURE:

The samples were air-dried then pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
BH49/0.2	23-Au0029828	25
BH53/0.2	23-Au0029829	20
BH54/0.2	23-Au0029830	28
BH55/0.2	23-Au0029831	25
BH56/0.2	23-Au0029832	24
BH57/0.2	23-Au0029833	34
BH58/0.2	23-Au0029834	21
BH59/0.2	23-Au0029835	31
BH60/0.2	23-Au0029836	21
BH62/0.2	23-Au0029886	18
BH65/0.2	23-Au0029887	21
BH66/0.2	23-Au0029888	30

Testing Officer: Michael Till (Senior Mineralogist)

Adelaide XRD Laboratory - 3/224 Glen Osmond Road, Fullarton, SA 5063
Agon Environmental Pty Ltd ABN 29 167 746 063
admin@agonenviro.com.au (08) 8166 2410
www.agonenviro.com.au

Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-15
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1039930	**RECEIVED IN LAB:**	2 November 2023
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	3 November 2023

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
CLO-BH3/0.0-0.2	23-Oc0074797	11
CLO-BH10/0.0-0.2	23-Oc0074804	24

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Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-28
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1063102	**RECEIVED IN LAB:**	31 January 2024
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	2 February 2024

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
DJR-BH2-K1 (0.0-0.2)	B24-Ja0044659	16
DJR-BH3-K1 (0.0-0.2)	B24-Ja0044660	7

Adelaide XRD Laboratory - 3/224 Glen Osmond Road, Fullarton, SA 5063
Agon Environmental Pty Ltd ABN 29 167 746 063
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Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-13
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1033622	**RECEIVED IN LAB:**	1 November 2023
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	3 November 2023

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
Hug2 – BH5/0-0.2	23-Oc0072318	21
Hug2 – BH12/0-0.2	23-Oc0072323	14

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www.agonenviro.com.au

Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-18
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1045826	**RECEIVED IN LAB:**	22 November 2023
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	24 November 2023

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
JUL-BH3/0.0-0.2	B23-No0048200	32
JUL-BH8/0.0-0.2	B23-No0048205	31

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Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-19
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1045841	**RECEIVED IN LAB:**	22 November 2023
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	24 November 2023

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
PEN-BH3/0.0-0.2	B23-No0048304	65
PEN-BH11/0.0-0.2	B23-No0048312	41

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Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-14
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1039911	**RECEIVED IN LAB:**	2 November 2023
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	3 November 2023

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
RIC-BH7/0.2	23-Oc0074637	20
RIC-BH10/0.2	23-Oc0074640	16

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admin@agonenviro.com.au (08) 8166 2410
www.agonenviro.com.au

Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-12
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1033622	**RECEIVED IN LAB:**	12 October 2023
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	12 October 2023

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
FLR330_BH16_H2 / 0.0-0.2m	23-Oc0022675	16
FLR330_TP6_H2 / 0.0-0.2m	23-Oc0022677	16

Adelaide XRD Laboratory - 3/224 Glen Osmond Road, Fullarton, SA 5063
Agon Environmental Pty Ltd ABN 29 167 746 063
admin@agonenviro.com.au (08) 8166 2410
www.agonenviro.com.au

Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-27
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1052671	**RECEIVED IN LAB:**	14 December 2023
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	15 December 2023

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
MISTP15_H1/0.0-0.2	B23-De0023558	23
MISTP9_H1/0.0-0.2	B23-De0023562	39

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☑ **Brisbane Laboratory** Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory** Unit 2 91 Leach Highway Kewdale WA 6105 08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory** 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project, Dajarra SS	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Dakshine Udayan
Handed over by	Dakshine Udayan
Email for Invoice	apinvoices@douglaspartners.com.au
Email for Results	Dawit.Bekele@douglaspartners.com.au

Analyses (Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing)

Containers (Change container type & size if necessary)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked)

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7a+B15	Suite B7	Respirable total crystalline silica (RCS) - 53710a	TRH C6-C10/BTEXN	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	DJR-BH2-K1 (0-0.2)	10/01/24	s	X										1		
2	DJR-BH2-K1 (0.3 - 0.5)	10/01/24	s											1		1063102
3	DJR-BH2-K1 (0.8 -1.0)	10/01/24	s											1		
4	DJR-BH2-K1 (1.3 -1.5)	10/01/24	s											1		
5	DJR-BH3-K1 (0-0.2)	11/01/24	s											1		
6	DJR-BH3-K1 (0.3 -0.5)	11/01/24	s	X										1		
7	DJR-BH3-K1 (0.8 -1.0)	11/01/24	s											1		
8	DJR-BH3-K1 (1.3- 1.5)	11/01/24	s											1		
9	DJR-BH2-K1 (0-0.2)	10/01/24	s			X									1	
10	DJR-BH3-K1 (0-0.2)	11/01/24	s			X									1	
		Total Counts		2		2								8	2	

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal Name Signature Date Time

Eurofins | mgt Laboratory Use Only							
Received By	Tom Hagan	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	T-H	Date 24/1/24	Time 6:40	Temperature 12.9
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Report №

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☑ Brisbane Laboratory
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Douglas Partner Pty Ltd	Project №	200446.02	Project Manager	Dawit Bekele
Address	439 Montague Road, West End Qld 4101	Project Name	CopperString 2.0 Project, Dajarra SS	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Dawit Bekele				
Phone №	0499 289 560				
Special Directions					
Purchase Order					
Quote ID №					

| | | | | |

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Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

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Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

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Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Asb)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	Douglas Partners (Qld) Pty Ltd
Contact name:	Dawit Bekele
Project name:	COPPERSTRING 2.0 PROJECT DAJARRA SS
Project ID:	20446.02
Turnaround time:	5 Day
Date/Time received	Jan 24, 2024 4:40 PM
Eurofins reference	1063102

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Zoe Flynn on phone : or by email: ZoeFlynn@eurofins.com

Results will be delivered electronically via email to Dawit Bekele - Dawit.Bekele@douglaspartners.com.au.

Note: A copy of these results will also be delivered to the general Douglas Partners (Qld) Pty Ltd email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

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Eurofins Environment Testing NZ Ltd
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+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
West End
QLD 4101

Order No.:
Report #: 1063102
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Jan 24, 2024 4:40 PM
Due: Feb 1, 2024
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 2.0 PROJECT DAJARRA SS
Project ID: 20446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail	Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254			X				
Brisbane Laboratory - NATA # 1261 Site # 20794		X	X	X	X	X	X
External Laboratory	X						

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	DJR-BH2-K1 (0-0.2)	Jan 10, 2024		Soil	B24-Ja0044657			X	X		X	
2	DJR-BH3-K1 (0.3-0.5)	Jan 12, 2024		Soil	B24-Ja0044658			X	X		X	
3	DJR-BH2-K1 (0-0.2) BAG	Jan 10, 2024		Soil	B24-Ja0044659	X						
4	DJR-BH3-K1 (0-0.2) BAG	Jan 11, 2024		Soil	B24-Ja0044660	X						
5	TRIP BLANK	Not Provided		Trip Blank (solid)	B24-Ja0044661							X
6	R1	Not Provided		Soil	B24-Ja0044662				X	X		
7	DJR-BH2-K1 (0.3-0.5)	Jan 10, 2024		Soil	B24-Ja0044663		X					
8	DJR-BH2-K1	Jan 10, 2024		Soil	B24-Ja0044664		X					

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
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Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

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Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
West End
QLD 4101

Project Name: COPPERSTRING 2.0 PROJECT DAJARRA SS
Project ID: 20446.02

Order No.:
Report #: 1063102
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Jan 24, 2024 4:40 PM
Due: Feb 1, 2024
Priority: 5 Day
Contact Name: Dawit Bekele

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X				
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X
	(0.8-1.0)											
9	DJR-BH2-K1 (1.3-1.5)	Jan 10, 2024		Soil	B24-Ja0044665		X					
10	DJR-BH3-K1 (0-0.2)	Jan 11, 2024		Soil	B24-Ja0044666		X					
11	DJR-BH3-K1 (0.8-1.0)	Jan 13, 2024		Soil	B24-Ja0044667		X					
12	DJR-BH3-K1 (1.3-1.5)	Jan 14, 2024		Soil	B24-Ja0044668		X					
Test Counts						2	6	2	3	1	2	1

Douglas Partners Pty Ltd
439 Montague Road
West End
QLD 4101

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Dawit Bekele**

Report **1063102-S**
Project name COPPERSTRING 2.0 PROJECT DAJARRA SS
Project ID 20446.02
Received Date Jan 24, 2024

Client Sample ID			**DJR-BH2-K1 (0-0.2)**	**DJR-BH3-K1 (0.3-0.5)**	**DJR-BH2-K1 (0-0.2) BAG**	**DJR-BH3-K1 (0-0.2) BAG**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Ja0044657**	**B24-Ja0044658**	**B24-Ja0044659**	**B24-Ja0044660**
Date Sampled			**Jan 10, 2024**	**Jan 12, 2024**	**Jan 10, 2024**	**Jan 11, 2024**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	-	-
TRH C10-C14	20	mg/kg	< 20	< 20	-	-
TRH C15-C28	50	mg/kg	< 50	< 50	-	-
TRH C29-C36	50	mg/kg	< 50	< 50	-	-
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	-	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	-
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	-
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	-	-
4-Bromofluorobenzene (surr.)	1	%	108	119	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	-	-
TRH C6-C10	20	mg/kg	< 20	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	-	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-

Client Sample ID			DJR-BH2-K1 (0-0.2)	DJR-BH3-K1 (0.3-0.5)	DJR-BH2-K1 (0-0.2) BAG	DJR-BH3-K1 (0-0.2) BAG
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Ja0044657**	**B24-Ja0044658**	**B24-Ja0044659**	**B24-Ja0044660**
Date Sampled			**Jan 10, 2024**	**Jan 12, 2024**	**Jan 10, 2024**	**Jan 11, 2024**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	-	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	95	98	-	-
p-Terphenyl-d14 (surr.)	1	%	117	116	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	-
a-HCH	0.05	mg/kg	< 0.05	< 0.05	-	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
b-HCH	0.05	mg/kg	< 0.05	< 0.05	-	-
d-HCH	0.05	mg/kg	< 0.05	< 0.05	-	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	-
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	-
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	-	-
Toxaphene	0.5	mg/kg	N/A	N/A	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	82	114	-	-
Tetrachloro-m-xylene (surr.)	1	%	89	120	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	-
Bolstar	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	-
Coumaphos	2	mg/kg	< 2	< 2	-	-
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	-	-
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	-	-
Diazinon	0.2	mg/kg	< 0.2	< 0.2	-	-
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	-	-
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	-	-
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	-	-
EPN	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethion	0.2	mg/kg	< 0.2	< 0.2	-	-

Client Sample ID			DJR-BH2-K1 (0-0.2)	DJR-BH3-K1 (0.3-0.5)	DJR-BH2-K1 (0-0.2) BAG	DJR-BH3-K1 (0-0.2) BAG
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Ja0044657**	**B24-Ja0044658**	**B24-Ja0044659**	**B24-Ja0044660**
Date Sampled			**Jan 10, 2024**	**Jan 12, 2024**	**Jan 10, 2024**	**Jan 11, 2024**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	-
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	-	-
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	-	-
Fenthion	0.2	mg/kg	< 0.2	< 0.2	-	-
Malathion	0.2	mg/kg	< 0.2	< 0.2	-	-
Merphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	-
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Monocrotophos	2	mg/kg	< 2	< 2	-	-
Naled	0.2	mg/kg	< 0.2	< 0.2	-	-
Omethoate	2	mg/kg	< 2	< 2	-	-
Phorate	0.2	mg/kg	< 0.2	< 0.2	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	-
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	-	-
Ronnel	0.2	mg/kg	< 0.2	< 0.2	-	-
Terbufos	0.2	mg/kg	< 0.2	< 0.2	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	-	-
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	-	-
Triphenylphosphate (surr.)	1	%	INT	121	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	-	-
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	82	114	-	-
Tetrachloro-m-xylene (surr.)	1	%	89	120	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	-	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	-	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	-	-
Pentachlorophenol	1	mg/kg	< 1	< 1	-	-
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	-	-
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	-	-
2-Nitrophenol	1.0	mg/kg	< 1	< 1	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	-	-

Client Sample ID			DJR-BH2-K1 (0-0.2)	DJR-BH3-K1 (0.3-0.5)	DJR-BH2-K1 (0-0.2) BAG	DJR-BH3-K1 (0-0.2) BAG
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Ja0044657**	**B24-Ja0044658**	**B24-Ja0044659**	**B24-Ja0044660**
Date Sampled			**Jan 10, 2024**	**Jan 12, 2024**	**Jan 10, 2024**	**Jan 11, 2024**
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	-	-
Total cresols*	0.5	mg/kg	< 0.5	< 0.5	-	-
4-Nitrophenol	5	mg/kg	< 5	< 5	-	-
Dinoseb	20	mg/kg	< 20	< 20	-	-
Phenol	0.5	mg/kg	< 0.5	< 0.5	-	-
Phenol-d6 (surr.)	1	%	92	94	-	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	-	-
TRH >C16-C34	100	mg/kg	< 100	< 100	-	-
TRH >C34-C40	100	mg/kg	< 100	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	-	-
Heavy Metals						
Arsenic	2	mg/kg	5.6	2.9	-	-
Cadmium	0.5	mg/kg	< 0.5	< 0.5	-	-
Chromium	5	mg/kg	52	29	-	-
Copper	5	mg/kg	93	140	-	-
Lead	5	mg/kg	7.2	5.6	-	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	-
Nickel	5	mg/kg	38	43	-	-
Zinc	5	mg/kg	49	37	-	-
Sample Properties						
% Moisture	1	%	7.5	3.2	-	-
Crystalline Silica			-	-		

Client Sample ID			TRIP BLANK	R1
Sample Matrix			**Trip Blank (solid)**	**Soil**
Eurofins Sample No.			**B24-Ja0044661**	**B24-Ja0044662**
Date Sampled			**Not Provided**[I12]	**Not Provided**[I12]
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	-	< 20
TRH C15-C28	50	mg/kg	-	< 50
TRH C29-C36	50	mg/kg	-	< 50
TRH C10-C36 (Total)	50	mg/kg	-	< 50
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	81	105

Client Sample ID			TRIP BLANK	R1
Sample Matrix			Trip Blank (solid)	Soil
Eurofins Sample No.			B24-Ja0044661	B24-Ja0044662
Date Sampled			Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	-	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50
TRH C6-C10	20	mg/kg	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	81
p-Terphenyl-d14 (surr.)	1	%	-	80
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	50	mg/kg	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	< 100
Heavy Metals				
Arsenic	2	mg/kg	-	4.5
Cadmium	0.5	mg/kg	-	< 0.5
Chromium	5	mg/kg	-	42
Copper	5	mg/kg	-	75
Lead	5	mg/kg	-	5.4
Mercury	0.1	mg/kg	-	< 0.1
Nickel	5	mg/kg	-	31
Zinc	5	mg/kg	-	40
Sample Properties				
% Moisture	1	%	-	5.3
Naphthalene[N02]	0.5	mg/kg	< 0.5	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-
Total Recoverable Hydrocarbons				
TRH C6-C10	20	mg/kg	< 20	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Brisbane	Feb 02, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Brisbane	Feb 02, 2024	14 Days
- Method: USEPA SW846 8260			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Brisbane	Feb 02, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Naphthalene	Brisbane	Feb 02, 2024	14 Days
- Method: USEPA 8260B - MGT 350A Volatile Organics by GCMS			
Total Recoverable Hydrocarbons	Brisbane	Feb 02, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Eurofins Suite B7A			
Polycyclic Aromatic Hydrocarbons	Brisbane	Feb 02, 2024	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Brisbane	Feb 02, 2024	14 Days
- Method: USEPA M 8270 (LTM-ORG-2130 PAH & Phenols in Soil & Water by GC-MS)			
Phenols (non-Halogenated)	Brisbane	Feb 02, 2024	14 Days
- Method: USEPA M 8270 (LTM-ORG-2130 PAH & Phenols in Soil & Water by GC-MS)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Brisbane	Feb 02, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Brisbane	Feb 02, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Brisbane	Feb 02, 2024	14 Days
- Method: LTM-ORG-2220 OCP and PCB in Soil and Water			
Organophosphorus Pesticides	Brisbane	Feb 02, 2024	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8270)			
Polychlorinated Biphenyls	Melbourne	Jan 31, 2024	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)			
% Moisture	Brisbane	Jan 29, 2024	14 Days
- Method: LTM-GEN-7080 Moisture			
Crystalline Silica	Melbourne	Jan 29, 2024	10 Days
- Method:			

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
West End
QLD 4101

Order No.:
Report #: 1063102
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Jan 24, 2024 4:40 PM
Due: Feb 1, 2024
Priority: 5 Day
Contact Name: Dawit Bekele

Project Name: COPPERSTRING 2.0 PROJECT DAJARRA SS
Project ID: 20446.02

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X				
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X
External Laboratory						X						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	DJR-BH2-K1 (0-0.2)	Jan 10, 2024		Soil	B24-Ja0044657			X	X		X	
2	DJR-BH3-K1 (0.3-0.5)	Jan 12, 2024		Soil	B24-Ja0044658			X	X		X	
3	DJR-BH2-K1 (0-0.2) BAG	Jan 10, 2024		Soil	B24-Ja0044659	X						
4	DJR-BH3-K1 (0-0.2) BAG	Jan 11, 2024		Soil	B24-Ja0044660	X						
5	TRIP BLANK	Not Provided		Trip Blank (solid)	B24-Ja0044661							X
6	R1	Not Provided		Soil	B24-Ja0044662				X	X		
7	DJR-BH2-K1 (0.3-0.5)	Jan 10, 2024		Soil	B24-Ja0044663		X					
8	DJR-BH2-K1	Jan 10, 2024		Soil	B24-Ja0044664		X					

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Douglas Partners (Qld) Pty Ltd
Address: 439 Montague Road
West End
QLD 4101

Project Name: COPPERSTRING 2.0 PROJECT DAJARRA SS
Project ID: 20446.02

Order No.:
Report #: 1063102
Phone: 07 3237 8900
Fax: 07 3237 8999

Received: Jan 24, 2024 4:40 PM
Due: Feb 1, 2024
Priority: 5 Day
Contact Name: Dawit Bekele

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						Crystalline Silica	HOLD	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Eurofins Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA # 1261 Site # 1254								X				
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	X	X	X
	(0.8-1.0)											
9	DJR-BH2-K1 (1.3-1.5)	Jan 10, 2024		Soil	B24-Ja0044665		X					
10	DJR-BH3-K1 (0-0.2)	Jan 11, 2024		Soil	B24-Ja0044666		X					
11	DJR-BH3-K1 (0.8-1.0)	Jan 13, 2024		Soil	B24-Ja0044667		X					
12	DJR-BH3-K1 (1.3-1.5)	Jan 14, 2024		Soil	B24-Ja0044668		X					
Test Counts						2	6	2	3	1	2	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit	**Colour:** Pt-Co Units	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	N/A			0.5	N/A	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 10			10	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.5			0.5	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	92			70-130	Pass	
TRH C10-C14	%	72			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	103			70-130	Pass	
Toluene	%	106			70-130	Pass	
Ethylbenzene	%	113			70-130	Pass	
m&p-Xylenes	%	114			70-130	Pass	
Xylenes - Total*	%	116			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	%	91			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	104			70-130	Pass	
Acenaphthylene	%	92			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Anthracene	%	99			70-130	Pass	
Benz(a)anthracene	%	70			70-130	Pass	
Benzo(a)pyrene	%	116			70-130	Pass	
Benzo(b&j)fluoranthene	%	126			70-130	Pass	
Benzo(g.h.i)perylene	%	85			70-130	Pass	
Benzo(k)fluoranthene	%	98			70-130	Pass	
Chrysene	%	81			70-130	Pass	
Dibenz(a.h)anthracene	%	110			70-130	Pass	
Fluoranthene	%	101			70-130	Pass	
Fluorene	%	95			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	115			70-130	Pass	
Naphthalene	%	102			70-130	Pass	
Phenanthrene	%	103			70-130	Pass	
Pyrene	%	94			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	88			70-130	Pass	
4.4'-DDD	%	91			70-130	Pass	
4.4'-DDE	%	91			70-130	Pass	
4.4'-DDT	%	126			70-130	Pass	
a-HCH	%	113			70-130	Pass	
Aldrin	%	72			70-130	Pass	
b-HCH	%	81			70-130	Pass	
d-HCH	%	70			70-130	Pass	
Dieldrin	%	116			70-130	Pass	
Endosulfan I	%	97			70-130	Pass	
Endosulfan II	%	86			70-130	Pass	
Endosulfan sulphate	%	72			70-130	Pass	
Endrin	%	127			70-130	Pass	
Endrin aldehyde	%	70			70-130	Pass	
Endrin ketone	%	104			70-130	Pass	
g-HCH (Lindane)	%	78			70-130	Pass	
Heptachlor	%	124			70-130	Pass	
Hexachlorobenzene	%	102			70-130	Pass	
Methoxychlor	%	89			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Azinphos-methyl	%	101			70-130	Pass	
Bolstar	%	96			70-130	Pass	
Chlorfenvinphos	%	92			70-130	Pass	
Chlorpyrifos	%	103			70-130	Pass	
Chlorpyrifos-methyl	%	88			70-130	Pass	
Coumaphos	%	127			70-130	Pass	
Demeton-S	%	94			70-130	Pass	
Demeton-O	%	121			70-130	Pass	
Diazinon	%	78			70-130	Pass	
Dichlorvos	%	80			70-130	Pass	
Dimethoate	%	101			70-130	Pass	
Disulfoton	%	102			70-130	Pass	
EPN	%	130			70-130	Pass	
Ethion	%	101			70-130	Pass	
Ethoprop	%	83			70-130	Pass	
Ethyl parathion	%	89			70-130	Pass	
Fenitrothion	%	124			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fensulfothion	%	113			70-130	Pass	
Fenthion	%	83			70-130	Pass	
Malathion	%	115			70-130	Pass	
Merphos	%	106			70-130	Pass	
Mevinphos	%	127			70-130	Pass	
Naled	%	76			70-130	Pass	
Omethoate	%	120			70-130	Pass	
Phorate	%	117			70-130	Pass	
Pirimiphos-methyl	%	81			70-130	Pass	
Pyrazophos	%	91			70-130	Pass	
Ronnel	%	79			70-130	Pass	
Terbufos	%	127			70-130	Pass	
Tetrachlorvinphos	%	97			70-130	Pass	
Tokuthion	%	97			70-130	Pass	
Trichloronate	%	96			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	106			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	117			25-140	Pass	
2.4-Dichlorophenol	%	90			25-140	Pass	
2.4.5-Trichlorophenol	%	103			25-140	Pass	
2.4.6-Trichlorophenol	%	136			25-140	Pass	
2.6-Dichlorophenol	%	97			25-140	Pass	
4-Chloro-3-methylphenol	%	96			25-140	Pass	
Pentachlorophenol	%	120			25-140	Pass	
Tetrachlorophenols - Total	%	126			25-140	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	65			25-140	Pass	
2-Methyl-4.6-dinitrophenol	%	54			25-140	Pass	
2-Nitrophenol	%	109			25-140	Pass	
2.4-Dimethylphenol	%	83			25-140	Pass	
2-Methylphenol (o-Cresol)	%	115			25-140	Pass	
3&4-Methylphenol (m&p-Cresol)	%	111			25-140	Pass	
4-Nitrophenol	%	120			25-140	Pass	
Phenol	%	123			25-140	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	70			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	83			80-120	Pass	
Cadmium	%	88			80-120	Pass	
Chromium	%	91			80-120	Pass	
Copper	%	91			80-120	Pass	
Lead	%	96			80-120	Pass	
Mercury	%	104			80-120	Pass	
Nickel	%	87			80-120	Pass	
Zinc	%	84			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	B24-Fe0002488	NCP	%	87			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	B24-Fe0002488	NCP	%	91			70-130	Pass	
Toluene	B24-Fe0002488	NCP	%	97			70-130	Pass	
Ethylbenzene	B24-Fe0002488	NCP	%	104			70-130	Pass	
m&p-Xylenes	B24-Fe0002488	NCP	%	107			70-130	Pass	
o-Xylene	B24-Fe0002488	NCP	%	108			70-130	Pass	
Xylenes - Total*	B24-Fe0002488	NCP	%	107			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	B24-Fe0002488	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	B24-Fe0002488	NCP	%	98			70-130	Pass	
Acenaphthylene	B24-Fe0002488	NCP	%	74			70-130	Pass	
Anthracene	B24-Fe0002488	NCP	%	90			70-130	Pass	
Benzo(a)pyrene	B24-Fe0002488	NCP	%	76			70-130	Pass	
Benzo(b&j)fluoranthene	B24-Fe0002488	NCP	%	103			70-130	Pass	
Benzo(g.h.i)perylene	B24-Fe0002488	NCP	%	73			70-130	Pass	
Benzo(k)fluoranthene	B24-Fe0002488	NCP	%	90			70-130	Pass	
Dibenz(a.h)anthracene	B24-Fe0002488	NCP	%	99			70-130	Pass	
Fluoranthene	B24-Fe0002488	NCP	%	79			70-130	Pass	
Fluorene	B24-Fe0002488	NCP	%	90			70-130	Pass	
Indeno(1.2.3-cd)pyrene	B24-Fe0002488	NCP	%	97			70-130	Pass	
Naphthalene	B24-Fe0002488	NCP	%	81			70-130	Pass	
Phenanthrene	B24-Fe0002488	NCP	%	84			70-130	Pass	
Pyrene	B24-Fe0002488	NCP	%	88			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	B24-Fe0002488	NCP	%	94			70-130	Pass	
4.4'-DDD	B24-Fe0002488	NCP	%	98			70-130	Pass	
4.4'-DDE	B24-Fe0002488	NCP	%	117			70-130	Pass	
4.4'-DDT	B24-Fe0002488	NCP	%	123			70-130	Pass	
a-HCH	B24-Fe0002488	NCP	%	89			70-130	Pass	
Aldrin	B24-Fe0002488	NCP	%	108			70-130	Pass	
b-HCH	B24-Fe0002488	NCP	%	99			70-130	Pass	
d-HCH	B24-Fe0002488	NCP	%	122			70-130	Pass	
Endosulfan I	B24-Fe0002488	NCP	%	81			70-130	Pass	
Endosulfan II	B24-Fe0013485	NCP	%	73			70-130	Pass	
Endrin	B24-Fe0015004	NCP	%	73			70-130	Pass	
Endrin aldehyde	B24-Ja0051680	NCP	%	86			70-130	Pass	
Endrin ketone	B24-Fe0002488	NCP	%	73			70-130	Pass	
g-HCH (Lindane)	B24-Fe0002488	NCP	%	121			70-130	Pass	
Hexachlorobenzene	B24-Fe0002488	NCP	%	112			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Azinphos-methyl	B24-Ja0051680	NCP	%	121			70-130	Pass	
Bolstar	B24-Fe0002488	NCP	%	73			70-130	Pass	
Chlorfenvinphos	B24-Ja0051680	NCP	%	111			70-130	Pass	
Chlorpyrifos	B24-Fe0002488	NCP	%	113			70-130	Pass	
Chlorpyrifos-methyl	B24-Ja0044845	NCP	%	93			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Coumaphos	B24-Ja0051680	NCP	%	104			70-130	Pass	
Demeton-S	B24-Fe0002488	NCP	%	96			70-130	Pass	
Diazinon	B24-Fe0002488	NCP	%	74			70-130	Pass	
Dichlorvos	B24-Ja0044845	NCP	%	93			70-130	Pass	
Dimethoate	B24-Ja0044845	NCP	%	104			70-130	Pass	
Disulfoton	B24-Fe0002488	NCP	%	95			70-130	Pass	
EPN	B24-Ja0044845	NCP	%	108			70-130	Pass	
Ethion	B24-Ja0051680	NCP	%	98			70-130	Pass	
Ethoprop	B24-Fe0002488	NCP	%	77			70-130	Pass	
Ethyl parathion	B24-Fe0002488	NCP	%	121			70-130	Pass	
Fenitrothion	B24-Ja0044845	NCP	%	88			70-130	Pass	
Fenthion	B24-Fe0002488	NCP	%	82			70-130	Pass	
Malathion	B24-Ja0044845	NCP	%	79			70-130	Pass	
Methyl parathion	B24-Ja0044845	NCP	%	124			70-130	Pass	
Mevinphos	B24-Ja0044845	NCP	%	130			70-130	Pass	
Naled	B24-Ja0051680	NCP	%	128			70-130	Pass	
Phorate	B24-Fe0002488	NCP	%	99			70-130	Pass	
Pirimiphos-methyl	B24-Fe0002488	NCP	%	81			70-130	Pass	
Pyrazophos	B24-Ja0051680	NCP	%	120			70-130	Pass	
Ronnel	B24-Ja0044845	NCP	%	71			70-130	Pass	
Terbufos	B24-Fe0002488	NCP	%	129			70-130	Pass	
Tokuthion	B24-Fe0002488	NCP	%	124			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	M24-Ja0035011	NCP	%	111			70-130	Pass	
Aroclor-1260	M24-Ja0035011	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	B24-Fe0002488	NCP	%	98			30-130	Pass	
2.4-Dichlorophenol	B24-Fe0002488	NCP	%	81			30-130	Pass	
2.4.5-Trichlorophenol	B24-Ja0051680	NCP	%	111			30-130	Pass	
2.4.6-Trichlorophenol	B24-Fe0002488	NCP	%	122			30-130	Pass	
2.6-Dichlorophenol	B24-Fe0002488	NCP	%	102			30-130	Pass	
4-Chloro-3-methylphenol	B24-Fe0002488	NCP	%	77			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Methyl-4.6-dinitrophenol	B24-Fe0002488	NCP	%	100			30-130	Pass	
2.4-Dimethylphenol	B24-Fe0002488	NCP	%	88			30-130	Pass	
2-Methylphenol (o-Cresol)	B24-Fe0002488	NCP	%	89			30-130	Pass	
Phenol	B24-Fe0002488	NCP	%	84			30-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Cadmium	B24-Fe0007149	NCP	%	84			75-125	Pass	
Copper	B24-Fe0007149	NCP	%	91			75-125	Pass	
Lead	B24-Fe0007149	NCP	%	97			75-125	Pass	
Mercury	B24-Fe0007149	NCP	%	84			75-125	Pass	
Nickel	B24-Fe0007149	NCP	%	107			75-125	Pass	
Zinc	B24-Fe0007149	NCP	%	92			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	B24-Ja0044658	CP	%	78			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	B24-Ja0044658	CP	%	76			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	B24-Ja0044360	NCP	%	106			75-125	Pass	
Chromium	B24-Ja0044360	NCP	%	106			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Benz(a)anthracene	B24-Ja0053026	NCP	%	80			70-130	Pass	
Chrysene	B24-Ja0037842	NCP	%	73			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Endosulfan sulphate	B24-Ja0037842	NCP	%	77			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Fensulfothion	B24-Ja0037842	NCP	%	123			70-130	Pass	
Monocrotophos	B24-Ja0037842	NCP	%	124			70-130	Pass	
Trichloronate	B24-Ja0037842	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
Tetrachlorophenols - Total	B24-Ja0037842	NCP	%	118			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	B24-Ja0037842	NCP	%	59			30-130	Pass	
2-Nitrophenol	B24-Ja0037842	NCP	%	114			30-130	Pass	
2.4-Dinitrophenol	B24-Ja0037842	NCP	%	103			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	B24-Ja0037842	NCP	%	95			30-130	Pass	
4-Nitrophenol	B24-Ja0037842	NCP	%	118			30-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B24-Ja0044657	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	B24-Ja0044657	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	B24-Ja0044657	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B24-Ja0044657	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B24-Ja0044657	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B24-Ja0044657	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B24-Ja0044657	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B24-Ja0044657	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	B24-Ja0044657	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	B24-Ja0044657	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B24-Ja0044657	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B24-Ja0044657	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M24-Ja0047027	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M24-Ja0047027	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M24-Ja0047027	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M24-Ja0047027	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M24-Ja0047027	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M24-Ja0047027	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M24-Ja0047027	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	M24-Ja0047027	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B24-Ja0044657	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B24-Ja0044657	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B24-Ja0044657	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B24-Ja0053087	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	B24-Ja0053087	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chromium	B24-Fe0007159	NCP	mg/kg	110	88	24	30%	Pass	
Copper	B24-Ja0053087	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	B24-Ja0053087	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	B24-Fe0007159	NCP	mg/kg	130	110	17	30%	Pass	
Zinc	B24-Ja0053087	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Mercury	B24-Ja0044281	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B24-Ja0044662	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	B24-Ja0044662	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	B24-Ja0044662	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B24-Ja0044662	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B24-Ja0044662	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B24-Ja0044662	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B24-Ja0044662	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	B24-Ja0044662	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	B24-Ja0044662	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B24-Ja0044662	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	B24-Ja0044662	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	B24-Ja0044662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	B24-Ja0044662	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	B24-Ja0044662	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	B24-Ja0044662	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Tokuthion	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	B24-Ja0044662	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	B24-Ja0044662	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	B24-Ja0044662	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	B24-Ja0044662	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	B24-Ja0044662	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	B24-Ja0044662	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	B24-Ja0044662	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Nitrophenol	B24-Ja0044662	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	B24-Ja0044662	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	B24-Ja0044662	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	B24-Ja0044662	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	B24-Ja0044662	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	B24-Ja0044662	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	B24-Ja0044662	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B24-Ja0044662	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B24-Ja0044662	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B24-Ja0044662	CP	mg/kg	< 100	< 100	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised by:

Zoe Flynn	Analytical Services Manager
Angelique Lang-Frey	Senior Analyst-Volatile
Edward Lee	Senior Analyst-Organic
Jonathon Angell	Senior Analyst-Metal
Jonathon Angell	Senior Analyst-Organic
Jonathon Angell	Senior Analyst-Sample Properties
Sarah McCallion	Senior Analyst-Organic
Sarah McCallion	Senior Analyst-Volatile



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Appendix H

Summary of Results

Douglas PARTNERS

Table 1: Summary of Laboratory Results – Priority metals, Priority PAH, Priority TRH, BTEX

			Priority metals								Priority PAH				Priority TRH						BTEX			
			Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ (BaP TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes
		PQL	2	0.4	5	5	5	0.1	5	5	0.5	0.5	0.5	0.5	20	50	20	50	100	100	0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
CLO- BH1/ 0.0-0.2	0 m	21/10/23	2.4	<0.4	39	31	<5	<0.1	18	15	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
CLO- BH2/ 0.0-0.2	0 m	21/10/23	3.5	<0.4	34	39	<5	<0.1	16	14	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
CLO- BH3/ 0.0-0.2	0 m	21/10/23	2.4	<0.4	51	44	<5	<0.1	22	15	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
CLO- BH4/ 0.0-0.2	0 m	21/10/23	3	<0.4	34	36	<5	<0.1	16	12	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
CLO- BH5/ 0.0-0.2	0 m	21/10/23	2.8	<0.4	28	24	<5	<0.1	12	11	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
CLO- BH6/ 0.0-0.2	0 m	21/10/23	2.3	<0.4	36	28	5.3	<0.1	37	22	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
CLO- BH7/ 0.0-0.2	0 m	21/10/23	3.2	<0.4	53	28	<5	<0.1	20	11	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
CLO- BH8/ 0.0-0.2	0 m	21/10/23	3	<0.4	49	26	<5	<0.1	20	11	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
CLO- BH9/ 0.0-0.1	0 m	21/10/23	36	<0.4	250	77	120	<0.1	210	83	<0.5	<0.5	<0.5	<0.5	<20	100	<20	100	180	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
CLO- BH10/ 0.0-0.2	0 m	21/10/23	3.2	<0.4	35	24	<5	<0.1	12	6.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
CLO-BH11/0.5-0.7	0 m	21/10/23	<2	<0.4	49	8.5	<5	<0.1	38	29	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
CLO- BH12/ 0.0-0.2	0 m	21/10/23	3.2	<0.4	26	20	<5	<0.1	11	10	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
Hug1-BH1/0-0.2	0 m	19/10/23	20	7.4	96	110	14	<0.1	81	310	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
Hug1-BH2/0.3-0.5	0 m	19/10/23	14	6	68	68	13	<0.1	57	200	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
Hug2-BH2/0-0.2	0 m	17/10/23	11	2.3	45	37	18	<0.1	29	98	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
Hug2-BH3/0.3-0.5	0 m	17/10/23	5.6	<0.5	29	20	12	<0.1	24	89	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
Hug1-BH3/0-0.2	0 m	17/10/23	9.3	2	46	42	15	<0.1	34	110	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
Hug2-BH1/0-0.2	0 m	17/10/23	8.9	1.3	47	36	18	<0.1	35	130	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
Hug2-BH4/0-0.2	0 m	17/10/23	8.1	2.8	38	36	11	<0.1	30	110	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
Hug2-BH5/0-0.2	0 m	18/10/23	15	1.6	44	41	16	<0.1	44	170	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
Hug2-BH6/0-0.2	0 m	17/10/23	16	3.5	50	49	11	<0.1	56	190	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
Hug2-BH7/0.3-0.5	0 m	18/10/23	12	1.8	47	38	13	<0.1	42	150	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
Hug2-BH8/0-0.2	0 m	18/10/23	8.8	0.8	42	33	18	<0.1	40	150	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
Hug2-BH9/0.3-0.5	0 m	18/10/23	5.1	<0.5	30	22	14	<0.1	25	100	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
Hug2-BH12/0-0.2	0 m	18/10/23	19	5.7	79	80	16	<0.1	71	250	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
RIC-BH1/0.5	0 m	20/10/23	6.5	<0.4	16	15	8.5	<0.1	17	53	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
RIC-BH2/0.2	0 m	21/10/23	5.8	<0.4	18	20	9.6	<0.1	19	60	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1

Douglas PARTNERS

Table 1: Summary of Laboratory Results – Priority metals, Priority PAH, Priority TRH, BTEX

			Priority metals								Priority PAH				Priority TRH						BTEX			
			Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ (BaP TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes
		PQL	2	0.4	5	5	5	0.1	5	5	0.5	0.5	0.5	0.5	20	50	20	50	100	100	0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
R2	0 m	21/10/23	4.4	<0.5	26	18	9.5	<0.1	13	61	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
RIC-BH3/0.2	0 m	21/10/23	3.9	<0.4	18	20	9	<0.1	23	57	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
RIC-BH4/0.2	0 m	20/10/23	4.6	<0.4	17	18	9.3	<0.1	17	54	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
RIC-BH5/0.2	0 m	20/10/23	4.6	<0.4	20	21	10	<0.1	22	63	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
RIC-BH6/0.2	0 m	20/10/23	5.7	0.8	22	26	11	<0.1	24	81	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
RIC-BH7/0.2	0 m	21/10/23	5.2	0.8	17	20	9.5	<0.1	22	72	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
RIC-BH8/0.5	0 m	21/10/23	4.2	<0.4	20	19	10	<0.1	21	63	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
RIC-BH9/0.2	0 m	21/10/23	4.5	<0.4	18	17	10	<0.1	18	54	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
RIC-BH10/0.2	0 m	21/10/23	4.6	<0.4	21	20	10	<0.1	20	60	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
RIC-BH11/0.2	0 m	21/10/23	3.6	<0.4	12	11	5.8	<0.1	15	44	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
RIC-BH12/0.5	0 m	21/10/23	20	9.9	26	67	9.1	<0.1	62	280	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
S3	0 m	22/10/23	<5	<1	36	7	<5	<0.1	30	15	<1	<0.5	<0.5	<0.5	<10	<50	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
R3	0 m	21/10/23	<2	<0.4	58	9.6	<5	<0.1	42	31	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105

Lab result

HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance **Red** = EGV-indirect exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level EGV = Environmental Guideline Value ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL

c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):

SAC based on generic land use thresholds for Residential A with garden/accessible soil

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

HIL	HIL-A (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour intrusion)	HSL-A/B (NEPC, 2013)	ESL	Urban Residential and Public Open Space (NEPC, 2013)
DC	Direct contact HSL A Residential (Low density) (CRC CARE, 2011)	ML	Residential, Parkland and Public Open Space (NEPC, 2013)

Table 1: Summary of Laboratory Results – Priority metals, Priority PAH, Priority TRH, BTEX

			Priority metals								Priority PAH				Priority TRH						BTEX			
			Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ (BaP TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes
		PQL	2	0.4	5	5	5	0.1	5	5	0.5	0.5	0.5	0.5	20	50	20	50	100	100	0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

Table 2: Summary of Laboratory Results – Priority OCP, Priority OPP, PCB

			Priority OCP								Priority OPP	PCB
			DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyriphos	Total PCB
		PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.2	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
CLO- BH1/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
CLO- BH2/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
CLO- BH3/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
CLO- BH4/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
CLO- BH5/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
CLO- BH6/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
CLO- BH7/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
CLO- BH8/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
CLO- BH9/ 0.0-0.1	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
CLO- BH10/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
CLO-BH11/0.5-0.7	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
CLO- BH12/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
Hug1-BH1/0-0.2	0 m	19/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
Hug1-BH2/0.3-0.5	0 m	19/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
Hug2-BH2/0-0.2	0 m	17/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
Hug2-BH3/0.3-0.5	0 m	17/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
Hug1-BH3/0-0.2	0 m	17/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
Hug2-BH1/0-0.2	0 m	17/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -

Table 2: Summary of Laboratory Results – Priority OCP, Priority OPP, PCB

			Priority OCP								Priority OPP	PCB
			DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyriphos	Total PCB
		PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.2	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hug2-BH4/0-0.2	0 m	17/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
Hug2-BH5/0-0.2	0 m	18/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
Hug2-BH6/0-0.2	0 m	17/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
Hug2-BH7/0.3-0.5	0 m	18/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
Hug2-BH8/0-0.2	0 m	18/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
Hug2-BH9/0.3-0.5	0 m	18/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
Hug2-BH12/0-0.2	0 m	18/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
RIC-BH1/0.5	0 m	20/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
RIC-BH2/0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
R2	0 m	21/10/23	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RIC-BH3/0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
RIC-BH4/0.2	0 m	20/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
RIC-BH5/0.2	0 m	20/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
RIC-BH6/0.2	0 m	20/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
RIC-BH7/0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
RIC-BH8/0.5	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
RIC-BH9/0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
RIC-BH10/0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -

Table 2: Summary of Laboratory Results – Priority OCP, Priority OPP, PCB

			Priority OCP								Priority OPP	PCB
			DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyriphos	Total PCB
		PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.2	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
RIC-BH11/0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
RIC-BH12/0.5	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
S3	0 m	22/10/23	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
R3	0 m	21/10/23	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

Lab result
HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance **Red** = EGV-indirect exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level EGV = Environmental Guideline Value ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL

c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):

SAC based on generic land use thresholds for Residential A with garden/accessible soil

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

HIL	HIL-A (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour intrusion)	HSL-A/B (NEPC, 2013)	ESL	Urban Residential and Public Open Space (NEPC, 2013)
DC	Direct contact HSL A Residential (Low density) (CRC CARE, 2011)	ML	Residential, Parkland and Public Open Space (NEPC, 2013)

Table 2: Summary of Laboratory Results – Priority OCP, Priority OPP, PCB

			Priority OCP								Priority OPP	PCB
			DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyriphos	Total PCB
		PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.2	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

Table QA1: Relative Percentage Difference Results – Soil Sampling

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	Priority metals								Priority PAH				PAH														Priority TRH						TRH		BTEX			
						Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (B(a)P)	Benzo(a)pyrene TEQ (B(a)P TEQ)	Total PAH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	TRH C6 - C9	TRH C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes
1039911	RIC-BH2/0.2	0 m	21/10/23	SOIL	mg/kg	5.8	<0.4	18	20	9.6	<0.1	19	60	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
1039911	R2	0 m	21/10/23	SOIL	mg/kg	4.4	<0.5	26	18	9.5	<0.1	13	61	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
			Difference			1.4	0.1	8	2	0.1	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD			27%	22%	**36%**	11%	1%	0%	**38%**	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1039911	RIC-BH12/0.5	0 m	21/10/23	SOIL	mg/kg	20	9.9	26	67	9.1	<0.1	62	280	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
EB2334180	S3	0 m	22/10/23	SOIL	mg/kg	<5	<1	36	7	<5	<0.1	30	15	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<50	<10	<50	<100	<100	<10	<50	<0.2	<0.5	<0.5	<0.5
			Difference			15	8.9	10	60	4.1	0	32	265	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10	0	0	0	10	30	0.1	0.4	0.4	0.4
			RPD			**120%**	**163%**	**32%**	**162%**	**58%**	0%	**70%**	**180%**	**67%**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	**67%**	0%	**67%**	0%	0%	0%	**67%**	**86%**	**67%**	**133%**	**133%**	**133%**
1039911	RIC-BH12/0.5	0 m	21/10/23	SOIL	mg/kg	20	9.9	26	67	9.1	<0.1	62	280	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
1039930	R3	0 m	21/10/23	SOIL	mg/kg	<2	<0.4	58	9.6	<5	<0.1	42	31	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
			Difference			18	9.5	32	57.4	4.1	0	20	249	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD			**164%**	**184%**	**76%**	**150%**	**58%**	0%	**38%**	**160%**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table QA2: Trip Blank Results - Soil Sampling

Sample ID	Sample Date	Media Being Sampled	Sample Type	Units	Priority TRH		TRH	BTEX				Lab Report No
					TRH C6 - C10	F1 ((C6-C10)-BTEX)	TRH C6 - C9	Benzene	Toluene	Ethylbenzene	Total Xylenes	
TRIP BLANK	18/10/23	Soil	SOIL	mg/kg	<20	<20	<20	<0.1	<0.1	<0.1	<0.1	1039590
TRIP BLANK	21/10/23	Soil	SOIL	mg/kg	<20	<20	<20	<0.1	<0.1	<0.1	<0.1	1039911

Table QA3: Trip Spike Results – Soil Sampling (% Recovery)

Sample ID	Sample Date	Media Being Sampled	Sample Type	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene	Lab Report No
TRIP SPIKE	21/10/23	Soil	SOIL	46	49	50	51	52	1039930
TRIP SPIKE	18/10/23	Soil	SOIL	12	14	14	14	13	1039590

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Table 1: Summary of Laboratory Results – Priority metals, Priority PAH, Priority TRH, BTEX

			Priority metals								Priority PAH				Priority TRH						BTEX			
			Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (B(a)P)	Benzo(a)pyrene TEQ (B(a)P TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes
		PQL	2	0.4	5	5	5	0.1	5	5	0.5	0.5	0.5	0.5	20	50	20	50	100	100	0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
JUL-BH1/0.0-0.2	0 m	31/10/23	8.7	<0.4	20	23	27	<0.1	18	49	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
JUL-BH2/0.0-0.2	0 m	31/10/23	7.5	<0.4	21	27	18	<0.1	20	64	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
JUL-BH3/0.0-0.2	0 m	31/10/23	6.2	<0.4	18	22	19	<0.1	16	47	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
JUL-BH4/0.0-0.2	0 m	31/10/23	7	<0.4	18	24	14	<0.1	18	56	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
JUL-BH5/0.0-0.2	0 m	31/10/23	6.9	<0.4	21	26	23	<0.1	20	58	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
JUL-BH6/0.3-0.5	0 m	31/10/23	6	<0.4	18	23	19	<0.1	17	50	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
JUL-BH7/0.0-0.2	0 m	31/10/23	6.6	<0.4	23	25	13	<0.1	18	58	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
JUL-BH8/0.0-0.2	0 m	31/10/23	7.7	<0.4	22	28	20	<0.1	20	60	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
JUL-BH9/0.0-0.2	0 m	31/10/23	7.1	<0.4	19	26	15	<0.1	18	57	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
JUL-BH10/0.0-0.2	0 m	31/10/23	7.1	3.5	13	31	5.7	<0.1	24	86	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
JUL-BH11/0.0-0.2	0 m	31/10/23	11	<0.4	26	33	19	<0.1	24	78	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
JUL-BH12/0.0-0.2	0 m	31/10/23	9.5	0.5	20	34	19	<0.1	24	82	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
PEN-BH1/0.0-0.2	0 m	03/11/23	<2	<0.4	18	<5	5	<0.1	<5	7.4	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
PEN-BH2/0.0-0.2	0 m	03/11/23	2.5	<0.4	39	6.9	9.3	<0.1	8.9	18	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
PEN-BH3/0.3-0.5	0 m	03/11/23	5.9	<0.4	39	<5	10	<0.1	<5	6	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
PEN-BH4/0.0-0.2	0 m	03/11/23	2.1	<0.4	13	<5	<5	<0.1	<5	<5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
PEN-BH5/0.0-0.2	0 m	03/11/23	6.9	<0.4	40	6.3	8.4	<0.1	<5	<5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
PEN-BH7/0.1-0.2	0 m	03/11/23	<2	<0.4	5.6	<5	<5	<0.1	<5	<5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
PEN-BH8/1.3-1.4	0 m	03/11/23	5.6	<0.4	57	17	10	<0.1	22	43	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
S2 (PEN-BH8/ 1.3 - 1.4)	0 m	03/11/23	8	<1	11	28	10	<0.1	17	59	<1	<0.5	<0.5	<0.5	<10	<50	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
R2	0 m	03/11/23	7.1	<0.5	76	17	11	<0.1	9.4	54	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
PEN-BH9/0.0-0.2	0 m	03/11/23	5.5	<0.4	110	10	11	<0.1	12	11	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
PEN-BH10/0.0-0.2	0 m	03/11/23	<2	<0.4	16	<5	<5	<0.1	<5	5.9	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1

Table 1: Summary of Laboratory Results – Priority metals, Priority PAH, Priority TRH, BTEX

			Priority metals								Priority PAH				Priority TRH						BTEX			
			Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (B(a)P)	Benzo(a)pyrene TEQ (B(a)P TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes
		PQL	2	0.4	5	5	5	0.1	5	5	0.5	0.5	0.5	0.5	20	50	20	50	100	100	0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
PEN-BH11/0.0-0.2	0 m	03/11/23	4.3	<0.4	51	18	21	<0.1	20	23	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
PEN-BH12/0.0-0.2	0 m	03/11/23	3.3	<0.4	37	14	14	<0.1	12	14	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105
EN-BH6/0.0-0.2	0 m	03/11/23	6.3	<0.4	59	12	17	<0.1	10	11	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 410	6,000 55	300 1,100	40 -	400 35	7,400 150	3 170	- 0.7	3 -	300 -	- -	- 120	45 180	110 -	- 300	- 2,800	0.5 50	160 85	55 70	40 105

Lab result

HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance **Red** = EGV-indirect exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level EGV = Environmental Guideline Value ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL

c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):

SAC based on generic land use thresholds for Residential A with garden/accessible soil

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

HIL	HIL-A (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour intrusion)	HSL-A/B (NEPC, 2013)	ESL	Urban Residential and Public Open Space (NEPC, 2013)
DC	Direct contact HSL A Residential (Low density) (CRC CARE, 2011)	ML	Residential, Parkland and Public Open Space (NEPC, 2013)

Douglas PARTNERS

Table 2: Summary of Laboratory Results – Priority OCP, Priority OPP, PCB

			Priority OCP								Priority OPP	PCB
			DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyriphos	Total PCB
		PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.2	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
JUL-BH1/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
JUL-BH2/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
JUL-BH3/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
JUL-BH4/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
JUL-BH5/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
JUL-BH6/0.3-0.5	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
JUL-BH7/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
JUL-BH8/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
JUL-BH9/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
JUL-BH10/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
JUL-BH11/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
JUL-BH12/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
PEN-BH1/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
PEN-BH2/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
PEN-BH3/0.3-0.5	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
PEN-BH4/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
PEN-BH5/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
PEN-BH7/0.1-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
PEN-BH8/1.3-1.4	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
S2 (PEN-BH8/ 1.3 - 1.4)	0 m	03/11/23	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
R2	0 m	03/11/23	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

Table 2: Summary of Laboratory Results – Priority OCP, Priority OPP, PCB

			Priority OCP								Priority OPP	PCB
			DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyriphos	Total PCB
		PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.2	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
PEN-BH9/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
PEN-BH10/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
PEN-BH11/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
PEN-BH12/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -
EN-BH6/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			240 180	6 -	270 -	10 -	6 -	10 -	300 -	20 -	160 -	1 -

Lab result

HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance **Red** = EGV-indirect exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level EGV = Environmental Guideline Value ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL

c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):

SAC based on generic land use thresholds for Residential A with garden/accessible soil

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

HIL	HIL-A (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour intrusion)	HSL-A/B (NEPC, 2013)	ESL	Urban Residential and Public Open Space (NEPC, 2013)
DC	Direct contact HSL A Residential (Low density) (CRC CARE, 2011)	ML	Residential, Parkland and Public Open Space (NEPC, 2013)

Table QA1: Relative Percentage Difference Results – Soil Sampling

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	Priority metals								Priority PAH				PAH																		Priority TRH						TRH		BTEX			
						Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo[a]pyrene TEQ (BaP* TEQ)	Total PAH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	TRH C6 - C9	TRH C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes
1045841	PEN-BH8/1.3-1.4	0 m	03/11/23	SOIL	mg/kg	5.6	<0.4	57	17	10	<0.1	22	43	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
EB2336640	S2 (PEN-BH8/1.3 - 1.4)	0 m	03/11/23	SOIL	mg/kg	8	<1	11	28	10	<0.1	17	59	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<50	<10	<50	<100	<100	<10	<50	<0.2	<0.5	<0.5	<0.5
			Difference			2.4	0.6	46	11	0	0	5	16	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10	0	0	0	10	30	0.1	0.4	0.4	0.4
			RPD			**35%**	**86%**	**135%**	**49%**	0%	0%	26%	**31%**	**67%**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	**67%**	0%	**67%**	0%	0%	0%	**67%**	**86%**	**67%**	**133%**	**133%**	**133%**

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	Priority metals								Priority PAH				PAH																		Priority TRH						TRH		BTEX			
						Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo[a]pyrene TEQ (BaP* TEQ)	Total PAH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	TRH C6 - C9	TRH C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes
1045841	PEN-BH8/1.3-1.4	0 m	03/11/23	SOIL	mg/kg	5.6	<0.4	57	17	10	<0.1	22	43	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
1045841	R2	0 m	03/11/23	SOIL	mg/kg	7.1	<0.5	76	17	11	<0.1	9.4	54	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
			Difference			1.5	0.1	19	0	1	0	12.6	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD			24%	22%	29%	0%	10%	0%	**80%**	23%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table QA2: Trip Blank Results - Soil Sampling

Sample ID	Sample Date	Media Being Sampled	Sample Type	Units	Priority TRH		TRH	BTEX				Lab Report No
					TRH C6 - C10	F1 ((C6-C10)-BTEX)	TRH C6 - C9	Benzene	Toluene	Ethylbenzene	Total Xylenes	
TRIP BLANK	31/10/23	Soil	SOIL	mg/kg	<20	<20	<20	<0.1	<0.1	<0.1	<0.1	1045826
TRIP BLANK	03/11/23	Soil	SOIL	mg/kg	<20	<20	<20	<0.1	<0.1	<0.1	<0.1	1045841

Table QA3: Trip Spike Results – Soil Sampling (% Recovery)

Sample ID	Sample Date	Media Being Sampled	Sample Type	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene	Lab Report No
TRIP SPIKE	31/10/23	Soil	SOIL	40	35	33	29	41	1045826
TRIP SPIKE	03/11/23	Soil	SOIL	75	68	70	76	65	1045841

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Table 1: Summary of Laboratory Results – Priority metals, Priority PAH, Priority TRH, BTEX

			Priority metals								Priority PAH				Priority TRH						BTEX			
			Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (B(a)P)	Benzo(a)pyrene TEQ (B(a)P TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes
		PQL	2	0.4	5	5	5	0.1	5	5	0.5	0.5	0.5	0.5	20	50	20	50	100	100	0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
CLO- BH1/ 0.0-0.2	0 m	21/10/23	2.4	<0.4	39	31	<5	<0.1	18	15	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
CLO- BH2/ 0.0-0.2	0 m	21/10/23	3.5	<0.4	34	39	<5	<0.1	16	14	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
CLO- BH3/ 0.0-0.2	0 m	21/10/23	2.4	<0.4	51	44	<5	<0.1	22	15	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
CLO- BH4/ 0.0-0.2	0 m	21/10/23	3	<0.4	34	36	<5	<0.1	16	12	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
CLO- BH5/ 0.0-0.2	0 m	21/10/23	2.8	<0.4	28	24	<5	<0.1	12	11	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
CLO- BH6/ 0.0-0.2	0 m	21/10/23	2.3	<0.4	36	28	5.3	<0.1	37	22	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
CLO- BH7/ 0.0-0.2	0 m	21/10/23	3.2	<0.4	53	28	<5	<0.1	20	11	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
CLO- BH8/ 0.0-0.2	0 m	21/10/23	3	<0.4	49	26	<5	<0.1	20	11	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
CLO- BH9/ 0.0-0.1	0 m	21/10/23	36	<0.4	250	77	120	<0.1	210	83	<0.5	<0.5	<0.5	<0.5	<20	100	<20	100	180	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
CLO- BH10/ 0.0-0.2	0 m	21/10/23	3.2	<0.4	35	24	<5	<0.1	12	6.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
CLO-BH11/0.5-0.7	0 m	21/10/23	<2	<0.4	49	8.5	<5	<0.1	38	29	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
CLO- BH12/ 0.0-0.2	0 m	21/10/23	3.2	<0.4	26	20	<5	<0.1	11	10	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
Hug1-BH1/0-0.2	0 m	19/10/23	20	7.4	96	110	14	<0.1	81	310	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
Hug1-BH2/0.3-0.5	0 m	19/10/23	14	6	68	68	13	<0.1	57	200	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
Hug2-BH2/0-0.2	0 m	17/10/23	11	2.3	45	37	18	<0.1	29	98	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
Hug2-BH3/0.3-0.5	0 m	17/10/23	5.6	<0.5	29	20	12	<0.1	24	89	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
Hug1-BH3/0-0.2	0 m	17/10/23	9.3	2	46	42	15	<0.1	34	110	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
Hug2-BH1/0-0.2	0 m	17/10/23	8.9	1.3	47	36	18	<0.1	35	130	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
Hug2-BH4/0-0.2	0 m	17/10/23	8.1	2.8	38	36	11	<0.1	30	110	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
Hug2-BH5/0-0.2	0 m	18/10/23	15	1.6	44	41	16	<0.1	44	170	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
Hug2-BH6/0-0.2	0 m	17/10/23	16	3.5	50	49	11	<0.1	56	190	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
Hug2-BH7/0.3-0.5	0 m	18/10/23	12	1.8	47	38	13	<0.1	42	150	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
Hug2-BH8/0-0.2	0 m	18/10/23	8.8	0.8	42	33	18	<0.1	40	150	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
Hug2-BH9/0.3-0.5	0 m	18/10/23	5.1	<0.5	30	22	14	<0.1	25	100	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
Hug2-BH12/0-0.2	0 m	18/10/23	19	5.7	79	80	16	<0.1	71	250	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
RIC-BH1/0.5	0 m	20/10/23	6.5	<0.4	16	15	8.5	<0.1	17	53	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
RIC-BH2/0.2	0 m	21/10/23	5.8	<0.4	18	20	9.6	<0.1	19	60	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
R2	0 m	21/10/23	4.4	<0.5	26	18	9.5	<0.1	13	61	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
RIC-BH3/0.2	0 m	21/10/23	3.9	<0.4	18	20	9	<0.1	23	57	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
RIC-BH4/0.2	0 m	20/10/23	4.6	<0.4	17	18	9.3	<0.1	17	54	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
RIC-BH5/0.2	0 m	20/10/23	4.6	<0.4	20	21	10	<0.1	22	63	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
RIC-BH6/0.2	0 m	20/10/23	5.7	0.8	22	26	11	<0.1	24	81	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
RIC-BH7/0.2	0 m	21/10/23	5.2	0.8	17	20	9.5	<0.1	22	72	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180

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Table 1: Summary of Laboratory Results – Priority metals, Priority PAH, Priority TRH, BTEX

			Priority metals								Priority PAH				Priority TRH						BTEX			
			Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (B(a)P)	Benzo(a)pyrene TEQ (B(a)P TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes
		PQL	2	0.4	5	5	5	0.1	5	5	0.5	0.5	0.5	0.5	20	50	20	50	100	100	0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
RIC-BH8/0.5	0 m	21/10/23	4.2	<0.4	20	19	10	<0.1	21	63	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
RIC-BH9/0.2	0 m	21/10/23	4.5	<0.4	18	17	10	<0.1	18	54	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
RIC-BH10/0.2	0 m	21/10/23	4.6	<0.4	21	20	10	<0.1	20	60	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
RIC-BH11/0.2	0 m	21/10/23	3.6	<0.4	12	11	5.8	<0.1	15	44	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
RIC-BH12/0.5	0 m	21/10/23	20	9.9	26	67	9.1	<0.1	62	280	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
S3	0 m	22/10/23	<5	<1	36	7	<5	<0.1	30	15	<1	<0.5	<0.5	<0.5	<10	<50	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
R3	0 m	21/10/23	<2	<0.4	58	9.6	<5	<0.1	42	31	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180

Lab result

HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance **Red** = EGV-indirect exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level EGV = Environmental Guideline Value ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL

c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):

SAC based on generic land use thresholds for Recreational C including public open space

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

HIL	HIL-C (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour intrusion)	HSL-C (NEPC, 2013)	ESL	Commercial and Industrial (NEPC, 2013)
		ML	Commercial and Industrial (NEPC, 2013)

Table 2: Summary of Laboratory Results – Priority OCP, Priority OPP, PCB

			Priority OCP								Priority OPP	PCB
			DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyriphos	Total PCB
		PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.2	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
CLO- BH1/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
CLO- BH2/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
CLO- BH3/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
CLO- BH4/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
CLO- BH5/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
CLO- BH6/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
CLO- BH7/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
CLO- BH8/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
CLO- BH9/ 0.0-0.1	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
CLO- BH10/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
CLO-BH11/0.5-0.7	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
CLO- BH12/ 0.0-0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
Hug1-BH1/0-0.2	0 m	19/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
Hug1-BH2/0.3-0.5	0 m	19/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
Hug2-BH2/0-0.2	0 m	17/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
Hug2-BH3/0.3-0.5	0 m	17/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
Hug1-BH3/0-0.2	0 m	17/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
Hug2-BH1/0-0.2	0 m	17/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
Hug2-BH4/0-0.2	0 m	17/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
Hug2-BH5/0-0.2	0 m	18/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
Hug2-BH6/0-0.2	0 m	17/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
Hug2-BH7/0.3-0.5	0 m	18/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -

Douglas PARTNERS

Table 2: Summary of Laboratory Results – Priority OCP, Priority OPP, PCB

			Priority OCP								Priority OPP	PCB
			DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyriphos	Total PCB
		PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.2	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hug2-BH8/0-0.2	0 m	18/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
Hug2-BH9/0.3-0.5	0 m	18/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
Hug2-BH12/0-0.2	0 m	18/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
RIC-BH1/0.5	0 m	20/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
RIC-BH2/0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
R2	0 m	21/10/23	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
RIC-BH3/0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
RIC-BH4/0.2	0 m	20/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
RIC-BH5/0.2	0 m	20/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
RIC-BH6/0.2	0 m	20/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
RIC-BH7/0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
RIC-BH8/0.5	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
RIC-BH9/0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
RIC-BH10/0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
RIC-BH11/0.2	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
RIC-BH12/0.5	0 m	21/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
S3	0 m	22/10/23	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
R3	0 m	21/10/23	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

Lab result

HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance **Red** = EGV-indirect exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting NAD = No Asbestos detected

Table 2: Summary of Laboratory Results – Priority OCP, Priority OPP, PCB

			Priority OCP								Priority OPP	PCB
			DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyriphos	Total PCB
		PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.2	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level EGV = Environmental Guideline Value ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL

c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):

SAC based on generic land use thresholds for Recreational C including public open space

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

HIL	HIL-C (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour intrusion)	HSL-C (NEPC, 2013)	ESL	Commercial and Industrial (NEPC, 2013)
		ML	Commercial and Industrial (NEPC, 2013)

Table QA1: Relative Percentage Difference Results – Soil Sampling

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	Priority metals								Priority PAH				PAH														Priority TRH						TRH		BTEX			
						Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (B(a)P)	Benzo(a)pyrene TEQ (B(a)P TEQ)	Total PAH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	TRH C6 - C9	TRH C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes
1039911	RIC-BH2/0.2	0 m	21/10/23	SOIL	mg/kg	5.8	<0.4	18	20	9.6	<0.1	19	60	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
1039911	R2	0 m	21/10/23	SOIL	mg/kg	4.4	<0.5	26	18	9.5	<0.1	13	61	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
			Difference			1.4	0.1	8	2	0.1	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD			27%	22%	**36%**	11%	1%	0%	**38%**	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1039911	RIC-BH12/0.5	0 m	21/10/23	SOIL	mg/kg	20	9.9	26	67	9.1	<0.1	62	280	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
EB2334180	S3	0 m	22/10/23	SOIL	mg/kg	<5	<1	36	7	<5	<0.1	30	15	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<50	<10	<50	<100	<100	<10	<50	<0.2	<0.5	<0.5	<0.5
			Difference			15	8.9	10	60	4.1	0	32	265	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10	0	0	0	10	30	0.1	0.4	0.4	0.4
			RPD			**120%**	**163%**	**32%**	**162%**	**58%**	0%	**70%**	**180%**	**67%**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	**67%**	0%	**67%**	0%	0%	0%	**67%**	**86%**	**67%**	**133%**	**133%**	**133%**
1039911	RIC-BH12/0.5	0 m	21/10/23	SOIL	mg/kg	20	9.9	26	67	9.1	<0.1	62	280	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
1039930	R3	0 m	21/10/23	SOIL	mg/kg	<2	<0.4	58	9.6	<5	<0.1	42	31	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
			Difference			18	9.5	32	57.4	4.1	0	20	249	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD			**164%**	**184%**	**76%**	**150%**	**58%**	0%	**38%**	**160%**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table QA2: Trip Blank Results - Soil Sampling

Sample ID	Sample Date	Media Being Sampled	Sample Type	Units	Priority TRH		TRH	BTEX				Lab Report No
					TRH C6 - C10	F1 ((C6-C10)-BTEX)	TRH C6 - C9	Benzene	Toluene	Ethylbenzene	Total Xylenes	
TRIP BLANK	18/10/23	Soil	SOIL	mg/kg	<20	<20	<20	<0.1	<0.1	<0.1	<0.1	1039590
TRIP BLANK	21/10/23	Soil	SOIL	mg/kg	<20	<20	<20	<0.1	<0.1	<0.1	<0.1	1039911

Table QA3: Trip Spike Results – Soil Sampling (% Recovery)

Sample ID	Sample Date	Media Being Sampled	Sample Type	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene	Lab Report No
TRIP SPIKE	21/10/23	Soil	SOIL	46	49	50	51	52	1039930
TRIP SPIKE	18/10/23	Soil	SOIL	12	14	14	14	13	1039590

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Table 1: Summary of Laboratory Results – Priority metals, Priority PAH, Priority TRH, BTEX

			Priority metals								Priority PAH				Priority TRH						BTEX			
			Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (B(a)P)	Benzo(a)pyrene TEQ (B(a)P TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes
		PQL	2	0.4	5	5	5	0.1	5	5	0.5	0.5	0.5	0.5	20	50	20	50	100	100	0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
JUL-BH1/0.0-0.2	0 m	31/10/23	8.7	<0.4	20	23	27	<0.1	18	49	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
JUL-BH2/0.0-0.2	0 m	31/10/23	7.5	<0.4	21	27	18	<0.1	20	64	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
JUL-BH3/0.0-0.2	0 m	31/10/23	6.2	<0.4	18	22	19	<0.1	16	47	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
JUL-BH4/0.0-0.2	0 m	31/10/23	7	<0.4	18	24	14	<0.1	18	56	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
JUL-BH5/0.0-0.2	0 m	31/10/23	6.9	<0.4	21	26	23	<0.1	20	58	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
JUL-BH6/0.3-0.5	0 m	31/10/23	6	<0.4	18	23	19	<0.1	17	50	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
JUL-BH7/0.0-0.2	0 m	31/10/23	6.6	<0.4	23	25	13	<0.1	18	58	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
JUL-BH8/0.0-0.2	0 m	31/10/23	7.7	<0.4	22	28	20	<0.1	20	60	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
JUL-BH9/0.0-0.2	0 m	31/10/23	7.1	<0.4	19	26	15	<0.1	18	57	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
JUL-BH10/0.0-0.2	0 m	31/10/23	7.1	3.5	13	31	5.7	<0.1	24	86	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
JUL-BH11/0.0-0.2	0 m	31/10/23	11	<0.4	26	33	19	<0.1	24	78	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
JUL-BH12/0.0-0.2	0 m	31/10/23	9.5	0.5	20	34	19	<0.1	24	82	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
PEN-BH1/0.0-0.2	0 m	03/11/23	<2	<0.4	18	<5	5	<0.1	<5	7.4	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
PEN-BH2/0.0-0.2	0 m	03/11/23	2.5	<0.4	39	6.9	9.3	<0.1	8.9	18	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
PEN-BH3/0.3-0.5	0 m	03/11/23	5.9	<0.4	39	<5	10	<0.1	<5	6	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
PEN-BH4/0.0-0.2	0 m	03/11/23	2.1	<0.4	13	<5	<5	<0.1	<5	<5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
PEN-BH5/0.0-0.2	0 m	03/11/23	6.9	<0.4	40	6.3	8.4	<0.1	<5	<5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
PEN-BH7/0.1-0.2	0 m	03/11/23	<2	<0.4	5.6	<5	<5	<0.1	<5	<5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
PEN-BH8/1.3-1.4	0 m	03/11/23	5.6	<0.4	57	17	10	<0.1	22	43	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
S2 (PEN-BH8/ 1.3 - 1.4)	0 m	03/11/23	8	<1	11	28	10	<0.1	17	59	<1	<0.5	<0.5	<0.5	<10	<50	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
R2	0 m	03/11/23	7.1	<0.5	76	17	11	<0.1	9.4	54	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
PEN-BH9/0.0-0.2	0 m	03/11/23	5.5	<0.4	110	10	11	<0.1	12	11	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
PEN-BH10/0.0-0.2	0 m	03/11/23	<2	<0.4	16	<5	<5	<0.1	<5	5.9	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1

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Table 1: Summary of Laboratory Results – Priority metals, Priority PAH, Priority TRH, BTEX

			Priority metals								Priority PAH				Priority TRH						BTEX			
			Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (B(a)P)	Benzo(a)pyrene TEQ (B(a)P TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes
		PQL	2	0.4	5	5	5	0.1	5	5	0.5	0.5	0.5	0.5	20	50	20	50	100	100	0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
PEN-BH11/0.0-0.2	0 m	03/11/23	4.3	<0.4	51	18	21	<0.1	20	23	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
PEN-BH12/0.0-0.2	0 m	03/11/23	3.3	<0.4	37	14	14	<0.1	12	14	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
EN-BH6/0.0-0.2	0 m	03/11/23	6.3	<0.4	59	12	17	<0.1	10	11	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180

Lab result

HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance **Red** = EGV-indirect exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level EGV = Environmental Guideline Value ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL

c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):

SAC based on generic land use thresholds for Recreational C including public open space

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

HIL	HIL-C (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour intrusion)	HSL-C (NEPC, 2013)	ESL	Commercial and Industrial (NEPC, 2013)
		ML	Residential, Parkland and Public Open Space (NEPC, 2013)

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Table 2: Summary of Laboratory Results – Priority OCP, Priority OPP, PCB

			Priority OCP								Priority OPP	PCB
			DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyriphos	Total PCB
		PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.2	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
JUL-BH1/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
JUL-BH2/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
JUL-BH3/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
JUL-BH4/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
JUL-BH5/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
JUL-BH6/0.3-0.5	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
JUL-BH7/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
JUL-BH8/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
JUL-BH9/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
JUL-BH10/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
JUL-BH11/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
JUL-BH12/0.0-0.2	0 m	31/10/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
PEN-BH1/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
PEN-BH2/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
PEN-BH3/0.3-0.5	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
PEN-BH4/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
PEN-BH5/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
PEN-BH7/0.1-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
PEN-BH8/1.3-1.4	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
S2 (PEN-BH8/ 1.3 - 1.4)	0 m	03/11/23	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

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Table 2: Summary of Laboratory Results – Priority OCP, Priority OPP, PCB

			Priority OCP								Priority OPP	PCB
			DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyriphos	Total PCB
		PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.2	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
R2	0 m	03/11/23	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
PEN-BH9/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
PEN-BH10/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
PEN-BH11/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
PEN-BH12/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
EN-BH6/0.0-0.2	0 m	03/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -

Lab result

HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance **Red** = EGV-indirect exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level EGV = Environmental Guideline Value ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL

c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):

SAC based on generic land use thresholds for Recreational C including public open space

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

HIL	HIL-C (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour intrusion)	HSL-C (NEPC, 2013)	ESL	Commercial and Industrial (NEPC, 2013)
		ML	Residential, Parkland and Public Open Space (NEPC, 2013)

Table 2: Summary of Laboratory Results – Priority OCP, Priority OPP, PCB

			Priority OCP								Priority OPP	PCB
			DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyriphos	Total PCB
		PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.2	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

Table QA1: Relative Percentage Difference Results – Soil Sampling

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	Priority metals								Priority PAH				PAH																		Priority TRH						TRH		BTEX			
						Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo[a]pyrene TEQ (BaP* TEQ)	Total PAH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	TRH C6 - C9	TRH C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes
1045841	PEN-BH8/1.3-1.4	0 m	03/11/23	SOIL	mg/kg	5.6	<0.4	57	17	10	<0.1	22	43	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
EB2336640	S2 (PEN-BH8/1.3 - 1.4)	0 m	03/11/23	SOIL	mg/kg	8	<1	11	28	10	<0.1	17	59	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<50	<10	<50	<100	<100	<10	<50	<0.2	<0.5	<0.5	<0.5
			Difference			2.4	0.6	46	11	0	0	5	16	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10	0	0	0	10	30	0.1	0.4	0.4	0.4
			RPD			**35%**	**86%**	**135%**	**49%**	0%	0%	26%	**31%**	**67%**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	**67%**	0%	**67%**	0%	0%	0%	**67%**	**86%**	**67%**	**133%**	**133%**	**133%**

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	Priority metals								Priority PAH				PAH																		Priority TRH						TRH		BTEX			
						Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo[a]pyrene TEQ (BaP* TEQ)	Total PAH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	TRH C6 - C9	TRH C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes
1045841	PEN-BH8/1.3-1.4	0 m	03/11/23	SOIL	mg/kg	5.6	<0.4	57	17	10	<0.1	22	43	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
1045841	R2	0 m	03/11/23	SOIL	mg/kg	7.1	<0.5	76	17	11	<0.1	9.4	54	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
			Difference			1.5	0.1	19	0	1	0	12.6	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD			24%	22%	29%	0%	10%	0%	**80%**	23%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table QA2: Trip Blank Results - Soil Sampling

Sample ID	Sample Date	Media Being Sampled	Sample Type	Units	Priority TRH		TRH	BTEX				Lab Report No
					TRH C6 - C10	F1 ((C6-C10)-BTEX)	TRH C6 - C9	Benzene	Toluene	Ethylbenzene	Total Xylenes	
TRIP BLANK	31/10/23	Soil	SOIL	mg/kg	<20	<20	<20	<0.1	<0.1	<0.1	<0.1	1045826
TRIP BLANK	03/11/23	Soil	SOIL	mg/kg	<20	<20	<20	<0.1	<0.1	<0.1	<0.1	1045841

Table QA3: Trip Spike Results – Soil Sampling (% Recovery)

Sample ID	Sample Date	Media Being Sampled	Sample Type	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene	Lab Report No
TRIP SPIKE	31/10/23	Soil	SOIL	40	35	33	29	41	1045826
TRIP SPIKE	03/11/23	Soil	SOIL	75	68	70	76	65	1045841

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Table 1: Summary of Laboratory Results – Priority metals, Priority PAH, Priority TRH, BTEX

			Priority metals								Priority PAH				Priority TRH						BTEX			
			Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (B(a)P)	Benzo(a)pyrene TEQ (B(a)P TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes
		PQL	2	0.5	5	5	5	0.1	5	5	0.5	0.5	0.5	0.5	20	50	20	50	100	100	0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
FLR330-BH7_H2/0.0-0.2	0 m	23/09/23	6	<0.5	26	28	14	<0.1	21	80	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
FLR330-BH9_H2/0.4-0.6	0 m	24/09/23	10	<0.5	33	33	15	<0.1	25	97	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
FLR330-BH16_H2/0.0-0.2	0 m	19/09/23	8	<0.4	33	34	15	<0.1	29	88	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
FLR330-TP2_H2/0.4-0.6	0 m	24/09/23	4.9	<0.5	27	24	13	<0.1	21	72	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
FLR330-TP6_H2/0.0-0.2	0 m	20/09/23	6	<0.4	29	26	14	<0.1	24	76	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
FLR330-BH13_H2/0.4-0.6	0 m	19/09/23	6.8	<0.5	36	29	14	<0.1	25	84	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
R1/0.4-0.6	0 m	19/09/23	6.7	<0.5	32	26	13	<0.1	22	75	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
FLR330-OTP2_H2/0.0-0.2	0 m	19/09/23	6.6	<0.5	32	26	15	<0.1	21	77	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
FLR330-TP5_H2/0.4-0.6	0 m	23/09/23	7.2	<0.5	36	30	17	<0.1	27	86	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			300 160	90 -	300 670	17,000 75	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180

Lab result

HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance **Red** = EGV-indirect exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level EGV = Environmental Guideline Value ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL

c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):

SAC based on generic land use thresholds for Recreational C including public open space

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

HIL	HIL-C (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour intrusion)	HSL-C (NEPC, 2013)	ESL	Commercial and Industrial (NEPC, 2013)
DC	Direct contact HSL C Recreational /Open space (CRC CARE, 2011)	ML	Commercial and Industrial (NEPC, 2013)

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Table 2: Summary of Laboratory Results – Priority OCP, Priority OPP, PCB

			Priority OCP								Priority OPP	PCB
			DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyriphos	Total PCB
		PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.2	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
FLR330-BH7_H2/0.0-0.2	0 m	23/09/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-999	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
FLR330-BH9_H2/0.4-0.6	0 m	24/09/23	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	-999	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
FLR330-BH16_H2/0.0-0.2	0 m	19/09/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
FLR330-TP2_H2/0.4-0.6	0 m	24/09/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-999	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
FLR330-TP6_H2/0.0-0.2	0 m	20/09/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
FLR330-BH13_H2/0.4-0.6	0 m	19/09/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	- -	250 -	1 -
R1/0.4-0.6	0 m	19/09/23	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
FLR330-OTP2_H2/0.0-0.2	0 m	19/09/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-999	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
FLR330-TP5_H2/0.4-0.6	0 m	23/09/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -

Lab result

HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance **Red** = EGV-indirect exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level EGV = Environmental Guideline Value ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL

c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):

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Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

HIL	HIL-C (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
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DC	Direct contact HSL C Recreational /Open space (CRC CARE, 2011)	ML	Commercial and Industrial (NEPC, 2013)

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Table QA1: Relative Percentage Difference Results – Soil Sampling

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	Priority metals								Priority PAH				PAH														Priority TRH						TRH		BTEX			
						Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo[a]pyrene TEQ (BaP TEQ)	Total PAH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	TRH C6 - C9	TRH C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes
1033622	FLR330-BH13_H2/0.4-0.6	0 m	19/09/23	SOIL	mg/kg	6.8	<0.5	36	29	14	<0.1	25	84	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
1033622	R1/0.4-0.6	0 m	19/09/23	SOIL	mg/kg	6.7	<0.5	32	26	13	<0.1	22	75	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1
			Difference			0.1	0	4	3	1	0	3	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD			1%	0%	12%	11%	7%	0%	13%	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table QA2: Trip Blank Results - Soil Sampling

Sample ID	Sample Date	Media Being Sampled	Sample Type	Units	Priority TRH		TRH	BTEX				Lab Report No
					TRH C6 - C10	F1 ((C6-C10)-BTEX)	TRH C6 - C9	Benzene	Toluene	Ethylbenzene	Total Xylenes	
TRIP BLANK	24/09/23	Soil	SOIL	mg/kg	<20	<20	<20	<0.1	<0.1	<0.1	<0.1	1033622

Table QA3: Trip Spike Results – Soil Sampling (% Recovery)

Sample ID	Sample Date	Media Being Sampled	Sample Type	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene	Lab Report No
TRIP SPIKE	24/09/23	Soil	SOIL	49	64	69	74	99	1033622

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Table 1: Summary of Laboratory Results – Priority metals, Priority PAH, Priority TRH, BTEX

			Priority metals								Priority PAH				Priority TRH						BTEX			
			Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (B(a)P)	Benzo(a)pyrene TEQ (B(a)P TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes
		PQL	2	0.5	5	5	5	0.1	5	5	0.5	0.5	0.5	0.5	20	50	20	50	100	100	0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MIS-TP15_H1/0.0-0.2	0 m	28/11/23	9.3	2.6	10	63	59	<0.1	34	910	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			3,000 160	900 -	3,600 680	240,000 70	1,500 1,800	730 -	6,000 60	400,000 190	NL 370	- 1.4	40 -	4,000 -	- -	- 170	260 215	NL -	- 1,700	- 3,300	3 75	NL 135	NL 165	230 180
MIS-BH27_H1/0.8-1.0	0 m	30/11/23	47	<0.5	21	40	83	<0.1	13	190	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			3,000 160	900 -	3,600 680	240,000 70	1,500 1,800	730 -	6,000 60	400,000 190	NL 370	- 1.4	40 -	4,000 -	- -	- 170	260 215	NL -	- 1,700	- 3,300	3 75	NL 135	NL 165	230 180
MIS-BH5_H1/0.1-0.3	0 m	30/11/23	<2	<0.5	31	83	26	<0.1	25	110	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			3,000 160	900 -	3,600 680	240,000 70	1,500 1,800	730 -	6,000 60	400,000 190	NL 370	- 1.4	40 -	4,000 -	- -	- 170	260 215	NL -	- 1,700	- 3,300	3 75	NL 135	NL 165	230 180
MIS-TP9_H1/0.0-0.2	0 m	29/11/23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
MIS-TP9_H1/0.3-0.5	0 m	29/11/23	42	0.7	7.5	24	28	<0.1	16	180	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			3,000 160	900 -	3,600 680	240,000 70	1,500 1,800	730 -	6,000 60	400,000 190	NL 370	- 1.4	40 -	4,000 -	- -	- 170	260 215	NL -	- 1,700	- 3,300	3 75	NL 135	NL 165	230 180
MIS-BH8_H1/1.3-1.5	0 m	29/11/23	2.6	<0.5	23	32	44	<0.1	16	78	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			3,000 160	900 -	3,600 680	240,000 70	1,500 1,800	730 -	6,000 60	400,000 190	NL 370	- 1.4	40 -	4,000 -	- -	- 170	260 215	NL -	- 1,700	- 3,300	3 75	NL 135	NL 165	230 180
R1	0 m		5.3	<0.5	27	38	44	<0.1	19	84	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			3,000 160	900 -	3,600 680	240,000 70	1,500 1,800	730 -	6,000 60	400,000 190	NL 370	- 1.4	40 -	4,000 -	- -	- 170	260 215	NL -	- 1,700	- 3,300	3 75	NL 135	NL 165	230 180
MIS-TP6_H1/0.3-0.5	0 m	30/11/23	12	1.1	7	52	35	<0.1	11	190	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.1
			3,000 160	900 -	3,600 680	240,000 70	1,500 1,800	730 -	6,000 60	400,000 190	NL 370	- 1.4	40 -	4,000 -	- -	- 170	260 215	NL -	- 1,700	- 3,300	3 75	NL 135	NL 165	230 180

Lab result

HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report Blue = DC exceedance Red = EGV-indirect exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting NAD = No Asbestos detected

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Notes:

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Table 2: Summary of Laboratory Results – Priority OCP, Priority OPP, PCB

			Priority OCP							Priority OPP	PCB
			DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyriphos	Total PCB
		PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MIS-TP15_H1/0.0-0.2	0 m	28/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1
			3,600 640	45 -	2,000 -	100 -	50 -	80 -	2,500 -	2,000 -	7 -
MIS-BH27_H1/0.8-1.0	0 m	30/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1
			3,600 640	45 -	2,000 -	100 -	50 -	80 -	2,500 -	2,000 -	7 -
MIS-BH5_H1/0.1-0.3	0 m	30/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1
			3,600 640	45 -	2,000 -	100 -	50 -	80 -	2,500 -	2,000 -	7 -
MIS-TP9_H1/0.0-0.2	0 m	29/11/23	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -
MIS-TP9_H1/0.3-0.5	0 m	29/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1
			3,600 640	45 -	2,000 -	100 -	50 -	80 -	2,500 -	2,000 -	7 -
MIS-BH8_H1/1.3-1.5	0 m	29/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1
			3,600 640	45 -	2,000 -	100 -	50 -	80 -	2,500 -	2,000 -	7 -
R1	0 m		-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -
MIS-TP6_H1/0.3-0.5	0 m	30/11/23	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1
			3,600 640	45 -	2,000 -	100 -	50 -	80 -	2,500 -	2,000 -	7 -

Lab result

HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

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Table QA1: Relative Percentage Difference Results – Soil Sampling

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	Priority metals								Priority PAH				PAH																Priority TRH					TRH		BTEX				Priority phenols			Phenols																							
						Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(b)pyrene TEQ (BaP TEQ)	Total PAH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)fluoranthene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	TRH C6 - C10	TRH >C10-C16	F1 (>C6-C10) minus BTEX	F2 (>C10-C16) minus Naphthalene	F3 (>C16-C34)	F4 (>C34-C40)	TRH C6 - C9	TRH C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes	Phenol	Pentachlorophenol	2-Methylphenol (o-Cresol)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,6-dichlorophenol	2-chlorophenol	4-Chloro-3-Methylphenol	3-methylphenol	4-methylphenol	2,4-dimethylphenol	2,4-dinitrophenol	2-Cyclohexyl-4,6-Dinitrophenol	2-methyl-4,6-Dinitrophenol	Cresols
1052671	MS-BH8_HV1 3-3.4	0 m	29/11/23	SOIL	mg/kg	2.6	<0.5	23	32	44	<0.1	16	78	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.5	<1	<0.2	<1	<1	<0.5	<0.5	<0.5	<1	<1	<5	<0.5	<5	<20	<5	<20
1052671	R1	0 m		SOIL	mg/kg	5.3	<0.5	27	38	44	<0.1	19	84	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.5	<1	<0.2	<1	<1	<0.5	<0.5	<0.5	<1	<1	<5	<0.5	<5	<20	<5	<20
			Difference			2.7	0	4	6	0	0	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD			**69%**	0%	16%	17%	0%	0%	17%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table QA2: Trip Blank Results - Soil Sampling

Sample ID	Sample Date	Media Being Sampled	Sample Type	Units	Priority TRH		TRH	BTEX				Lab Report No
					TRH C6 - C10	F1 ((C6-C10)-BTEX)	TRH C6 - C9	Benzene	Toluene	Ethylbenzene	Total Xylenes	
TRIP BLANK		Soil	SOIL	mg/kg	<20	<20	<20	<0.1	<0.1	<0.1	<0.1	1052671

Table QA3: Trip Spike Results – Soil Sampling (% Recovery)

Sample ID	Sample Date	Media Being Sampled	Sample Type	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene	Lab Report No
TRIP SPIKE		Soil	SOIL	2.9	5.9	6.6	6.5	7.6	1052671

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Table 1: Summary of Laboratory Results – Priority metals, Priority PAH, Priority TRH, BTEX

			Priority metals								Priority PAH				Priority TRH						BTEX			
			Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (B(a)P)	Benzo(a)pyrene TEQ (B(a)P TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes
		PQL	2	0.5	5	5	5	0.1	5	5	0.5	0.5	0.5	0.5	20	50	20	50	100	100	0.1	0.1	0.1	0.3
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DJR-BH2-K1 (0-0.2)	0 m	10/01/24	5.6	<0.5	52	93	7.2	<0.1	38	49	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3
			300 160	90 -	300 680	17,000 70	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
R1	0 m		4.5	<0.5	42	75	5.4	<0.1	31	40	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3
			300 160	90 -	300 680	17,000 70	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180
DJR-BH3-K1 (0.3-0.5)	0 m	12/01/24	2.9	<0.5	29	140	5.6	<0.1	43	37	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3
			300 160	90 -	300 680	17,000 70	600 1,800	80 -	1,200 60	30,000 190	NL 370	- 1.4	3 -	300 -	- -	- 170	NL 215	NL -	- 1,700	- 3,300	NL 75	NL 135	NL 165	NL 180

Lab result

HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance **Red** = EGV-indirect exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Not limiting NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level EGV = Environmental Guideline Value ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL

c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):

SAC based on generic land use thresholds for Recreational C including public open space

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

HIL	HIL-C (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour intrusion)	HSL-C (NEPC, 2013)	ESL	Commercial and Industrial (NEPC, 2013)
DC	Direct contact HSL C Recreational /Open space (CRC CARE, 2011)	ML	Commercial and Industrial (NEPC, 2013)

Table 2: Summary of Laboratory Results – Priority OCP, Priority OPP, PCB

			Priority OCP								Priority OPP	PCB
			DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyriphos	Total PCB
		PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.2	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DJR-BH2-K1 (0-0.2)	0 m	10/01/24	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-999	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -
R1	0 m		-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
DJR-BH3-K1 (0.3-0.5)	0 m	12/01/24	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-999	<0.2	<0.1
			400 640	10 -	340 -	20 -	10 -	10 -	400 -	30 -	250 -	1 -

Lab result

HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance **Red** = EGV-indirect exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Not limiting NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level EGV = Environmental Guideline Value ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL

c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):

SAC based on generic land use thresholds for Recreational C including public open space

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

HIL	HIL-C (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour intrusion)	HSL-C (NEPC, 2013)	ESL	Commercial and Industrial (NEPC, 2013)
DC	Direct contact HSL C Recreational /Open space (CRC CARE, 2011)	ML	Commercial and Industrial (NEPC, 2013)

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Table QA1: Relative Percentage Difference Results – Soil Sampling

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	Priority metals								Priority PAH				PAH														Priority TRH						TRH		BTEX			
						Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ (BaP TEQ)	Total PAH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10) -BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	TRH C6 - C9	TRH C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes
1063102	DJR-BH2-K1 (0-0.2)	0 m	10/01/24	Soil	mg/kg	5.6	<0.5	52	93	7.2	<0.1	38	49	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.3
1063102	R1	0 m		Soil	mg/kg	4.5	<0.5	42	75	5.4	<0.1	31	40	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.3
			Difference		mg/kg	1.1	0	10	18	1.8	0	7	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD		%	22%	0%	21%	21%	29%	0%	20%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table QA2: Trip Blank Results - Soil Sampling

Sample ID	Sample Date	Media Being Sampled	Sample Type	Units	Priority TRH		TRH	BTEX				Lab Report No
					TRH C6 - C10	F1 ((C6-C10)-BTEX)	TRH C6 - C9	Benzene	Toluene	Ethylbenzene	Total Xylenes	
TRIP BLANK		Soil	Soil	mg/kg	<20	<20	<20	<0.1	<0.1	<0.1	<0.3	1063102

Appendix I

Qualitative Baseline Screening Health Risk Assessment for Crystalline Silica in Soil, CopperString 2.0 Project

Douglas PARTNERS | GROUNDED EXPERTISE

CPB Contractors Pty Ltd
Level 6, 199 Grey Street
South Brisbane, QLD 4101

Attention: Mr Graham Tom
Email: tom.graham@cpbcon.com.au

200446.02
26 February 2024
R.004.Rev0
TK, PG:jl

Qualitative Baseline Screening Health Risk Assessment for Crystalline Silica in Soil CopperString 2.0 Project Woodstock to Mt Isa, Various QLD

1. Executive Summary

Douglas Partners Pty Ltd (Douglas) conducted a health risk assessment relating to potential exposure to respirable crystalline silica (RCS) due to disturbance of soil / fill during certain activities undertaken during the CopperString 2.0 Project. The assessment was conducted in general accordance with the Australian Institute of Occupational Hygienists (AIOH) *Simplified Occupational Hygiene Risk Management Strategies,* June 2020 (AIOH, 2020).

This assessment identified a **moderate to high risk level** for the following groups of workers:

- General site occupants (campsite, transmission lines, substations);
- Cleaning and grounds maintenance workers;
- Plant operators and associated workers.

Appropriate controls should be identified and implemented in accordance with the hierarchy of control to manage health risk. Further information gathering should also be undertaken in order to develop a more detailed and reliable health risk assessment.

2. Introduction

Douglas was engaged by CPB Contractors Pty Ltd (CPB) to conduct a qualitative, baseline screening health risk assessment for the CopperString 2.0 Project (the 'Project'). The Project initially involves building 840 km of new electricity transmission line from just south of Townsville, in the Burdekin region, to Mount Isa to connect Queensland's North West Minerals Province (NWMP) to the National Electricity Market. Approximately 200 km of additional transmission line will be required to connect new renewable generators to CopperString. Construction is due to commence in 2024 with completion expected by 2029.

This assessment by Douglas relates to potential exposure of the following workers to RCS at campsites, transmission lines and substations:

- General site occupants;
- Cleaning and grounds maintenance workers;
- Plant operators and associated workers.

This letter report:

- Provides site details and background information;
- Outlines the risk assessment method used;
- Documents the risk assessment process and the results obtained;
- Identifies potential control measures; and
- Outlines requirements for monitoring / review.

Notes about this report are contained in Attachment A. A site plan is contained in Attachment B. A selection of site photographs is contained in Attachment C. Laboratory analytical reports are contained in Attachment D.

3. Available Data

Prior to this assessment, and as part of an Environmental Site Investigation (ESI)[1] for Contamination, samples of topsoil (0 to 0.2 m bgl) were previously collected from locations along the proposed transmission lines, at substation sites and at campsites. These samples were analysed for Crystalline Silica (quartz) content and results are summarised in Tables 1 to 3 below.

Table 1: Crystalline Silica (quartz) Results for Transmission Lines.

Test Bore	Quartz Est. Weight %
BH49	25
BH53	20
BH54	28
BH55	25
BH56	24
BH57	34
BH58	21
BH59	31

1 Douglas (2024). *Environmental Site Investigation for Contamination, Report no 200446.02.R003.Rev0,* in Draft.

Test Bore	Quartz Est. Weight %
BH60	21
BH62	18
BH65	21
BH66	30

Table 2: Crystalline Silica (quartz) Results for Substations.

Substation	Quartz Est. Weight %
Mount Isa Substation (Lot 422 on SP128451)	MISTP15_H1 (23%) MISTP9_H1 (39%)
Finders 300 and 500 Substation (Lot 1 on DG35)	FLR330_BH16_H2 (16%) FLR330_TP6_H2 (16%)
Dajarra Road Substation (Lot 521 on CP905413)	DJR-BH2-K1 (16%) DJR-BH3-K1 (7%)

Table 3: Crystalline Silica (quartz) Results for Campsites.

Campsites	Quartz Est. Weight %
Pentland Campsite (Lot 35 on GF838294)	PEN-BH3 (65%) PEN-BH11(41%)
Hughenden Campsite (Lot 129 on SP119557 and Lot 69 on SP316362)	Hug2 – BH5 (21%) Hug2 – BH12 (14%)
Richmond Campsite (Lot 21 on SP334224, Lot 221 to Lot 224 on SP137115)	RIC-BH7 (20%) RIC-BH10 (16%)
Julia Creek Campsite (Lot 99 on SP247177)	JUL-BH3 (32%) JUL-BH8 (31%)
Cloncurry Campsite (Lot 160 on SP166293)	CLO-BH3 (11%) CLO-BH10 (24%)

4. Method

This qualitative baseline screening risk assessment has been conducted in general accordance with AIOH (2020). AIOH (2020) comprises a seven-step risk assessment process that was applied by DP as outlined in the following sections of this report. This assessment comprised a desktop exercise only based on the Available Data specified in Section 3 and AIOH (2020).

5. Risk Assessment

5.1 Step 1 – Workplace Characterisation

The workplace is characterised by Similar Exposure Groups (SEG's) comprising persons who are expected to have a similar exposure to the same range of hazards. The SEG's considered in this assessment, location(s), hazard type and potential activities involved are outlined in Table 4 below.

Table 4: Similar Exposure Groups (SEGs)

SEG	Location	Hazard Type	Key Activities
SEG 1 General Site Occupants	Campsites	RCS	General occupation during: • Minor vehicle / plant movement • Cleaning (e.g., sweeping / blowing) • Grounds maintenance (e.g., mowing) • Minor land clearing • Minor earthworks (e.g., drilling / piling, excavation, levelling, grading, trenching, compaction, material handling) • Wind-blown dust
SEG 2 General Site Occupants	Transmission Lines Substations	RCS	General occupation during: • Substantial vehicle / plant movement • Cleaning (e.g., sweeping / blowing) • Grounds maintenance (e.g., mowing) • Land clearing • Substantial earthworks (e.g., drilling / piling, excavation, levelling, grading, trenching, compaction, material handling) • Wind-blown dust
SEG 3 Cleaners	Campsites Transmission Lines Substations	RCS	• Sweeping • Blowing • Dusting / wiping • Vacuuming • Beating rugs / mats

SEG	Location	Hazard Type	Key Activities
SEG 4 Grounds Maintenance	Campsites Transmission Lines Substations	RCS	• Mowing • Blowing • Digging / tilling • Grading / levelling
SEG 5 Plant Operators • Land Clearing • Earthworks	Campsites Transmission Lines Substations	RCS	• Drilling • Bulk excavation • Levelling / grading • Trenching • Compaction • Bulk material handling
SEG 5 Personnel frequently working near plant (e.g., labourers, safety lookouts, traffic control, supervisors and other essential personnel)	Campsites Transmission Lines Substations	RCS	Workers stationed in the direct vicinity of: • Drilling • Bulk excavation • Levelling / grading • Trenching • Compaction • Bulk material handling

5.2 Step 2 – Hazard identification and consequence

The hazard identified comprises crystalline silica (quartz) in topsoil (0 to 0.2 m bgl). Crystalline silica was detected in all samples analysed (refer Section 3) at concentrations ranging from 14 to 65 % w/w. Whilst the silica may not currently be in the form of respirable dust, there is potential that site activities (e.g., plant operation) may generate respirable dust including respirable crystalline silica (RCS).

The respirable fraction of quartz has been classified as a category 1A carcinogen according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) as it has been shown to cause cancer in humans[2].

The International Agency for Research on Cancer (IARC) have classified crystalline silica, including in the form of quartz dust, as carcinogenic to humans (Group 1)[3].

The US Department of Health and Human Services (DHHS) classifies crystalline silica (respirable size) as a known human carcinogen[4].

AIOH (2020) lists respirable crystalline silica as an occupational carcinogen and indicates a consequence rating of 4 (Major) to 5 (Severe) (refer Table 2.1, p.35).

Based on the above information, a health exposure consequence rating of ***Major*** to ***Severe*** has been adopted for crystalline silica (quartz) dust. This consequence rating is described in AIOH (2020) as:

- ***Major*** – potential irreversible health effects of disabling illness to one or more people; and
- ***Severe*** - potential fatality, cancer or reproductive / genetic health effects to one or more people.

5.3 Step 3 – Exposure characterisation and likelihood

Exposure ratings were determined based on Table 3.6 *In-air exposure – Qualitative chemical exposure descriptor* in AIOH (2020). The exposure ratings adopted for the SEG's identified (refer Table 4 in Section 5.1 of this report) are summarised in Table 5 below.

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[2] Safe Work Australia *Health Monitoring: Guide for crystalline silica,* accessed at: https://www.safeworkaustralia.gov.au/sites/default/files/2021-09/health-monitoring-guidance-crystalline-silica.pdf on 14 February 2024.

[3] IARC (International Agency for Research on Cancer) 2012. *Monographs on the Evaluation of Carcinogenic Risks to Humans - Arsenic, Metals, Fibres and Dusts,* Volume 100 C, accessed at: https://www.ncbi.nlm.nih.gov/books/NBK304375/ on 15 February 2024.

[4] US DHHS (Department of Health and Human Services), National Toxicology Program, *15th Report on Carcinogens 2021*, accessed at: https://ntp.niehs.nih.gov/sites/default/files/ntp/roc/content/profiles/silica.pdf on 14 February 2024.

Table 5: Exposure Ratings (AIOH, 2020)

Scenario	In-Air Exposure Descriptor *
SEG 1 General Site Occupants (Campsites)	**Unlikely** – Periodic contact with the potential hazard at moderate concentrations and / or regular contact with the potential hazard at low concentrations
SEG 2 General Site Occupants (Transmission Lines, Substations)	**Unlikely** – Periodic contact with the potential hazard at moderate concentrations and / or regular contact with the potential hazard at low concentrations
SEG3 Cleaners	**Possible** – Periodic contact with the potential hazard at high levels or regular contact with the potential hazard at moderate levels.
SEG4 Grounds Maintenance	**Possible** – Periodic contact with the potential hazard at high levels or regular contact with the potential hazard at moderate levels.
SEG5 Plant Operators	**Possible** – Periodic contact with the potential hazard at high levels or regular contact with the potential hazard at moderate levels.
SEG6 Personnel frequently working near plant	**Possible** – Periodic contact with the potential hazard at high levels or regular contact with the potential hazard at moderate levels.

* Refer Table 3.6 in AIOH (2020).

5.4 Step 4 – Level of risk

Health risk ratings were determined in accordance with the relevant matrix in Appendix 4 of AIOH (2020) (refer Figure 1 below) and were based on the:

- SEG's identified in Section 5.1 of this report;
- Hazard consequence descriptors (refer Section 5.2); and
- Exposure ratings (refer Section 5.3).

The health risk ratings for this assessment are summarised in Table 6 below. A **high risk** level was identified for all of the SEG's considered.

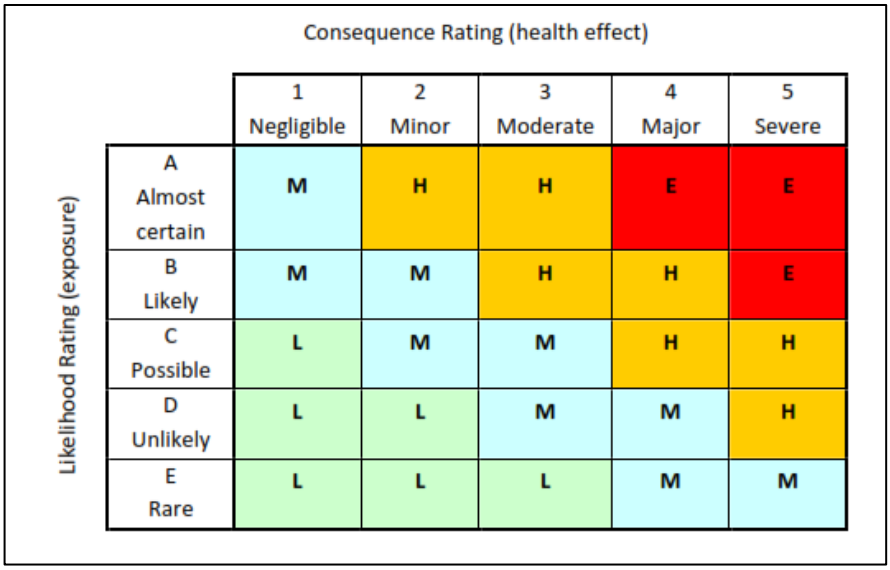

Figure 1: Health Risk Matrix (AIOH, 2020)

Table 6: Health Risk Rating

Scenario	Hazard Consequence Descriptor	Exposure Consequence Rating	Health Risk Rating
SEG 1 General Site Occupants (Campsites)	Major to Severe	Unlikely	**Moderate to High**
SEG 2 General Site Occupants (Transmission Lines, Substations)			
SEG3 Cleaners		Possible	**High**
SEG4 Grounds Maintenance			
SEG5 Plant Operators			
SEG6 Personnel frequently working near plant			

A degree of uncertainty is associated with these ratings for reasons that include, but are not be limited to:

- Variability of the silica content in soil and fill materials;

- Uncertainty around the precise nature, frequency and duration of the activities that will be undertaken by each SEG (refer Table 4); and
- Proclivity of relevant activities to generate freshly fractured silica dust and dust in the respirable size fraction.

As such, in accordance with the 2nd table in Appendix 4 of AIOH (2020), a general uncertainty rating of ***Uncertain*** is adopted. When this uncertainty rating is combined with the health risk ratings in Table 6 above, the following types of actions are identified in AIOH (2020):

- Proactive control / mitigation; and / or
- Information gathering.

5.5 Step 5 – Control / Treatment of Risks

Where risk assessment indicates the need for control / mitigation measures, these should be identified and implemented in accordance with the hierarchy of control. AIOH (2020) (p.19) outlines this hierarchy as elimination, substitution / reduction, isolation, engineering controls, procedures and training and Personal Protective Equipment (PPE).

Note that a suite of controls is often required to sufficiently manage risk and that PPE should only be adopted where it is not reasonably practicable to implement higher level controls.

For informative purposes, a range of potential controls are identified in Table 7 below. These controls are examples only and are not intended to be an exhaustive list of all controls that may apply to the work / activities proposed.

Further information gathering should be undertaken to develop a more detailed and reliable health risk assessment for relevant SEG's. This may include, for example, further characterisation of the workplace, SEG's and/or expected exposures, including the potential for exposure to freshly fractured silica dust and the particle size fractions likely to be generated.

Table 7: Example Controls

Hierarchy of Control	Example Controls
Elimination	Do not disturb the soil / fill.
Substitution / Reduction	Avoid dry sweeping, air-blowing and beating activities etc. when cleaning. Instead, use other methods such as vacuuming and wet sweeping / wiping / washing. Note that: • Vacuums should comprise a HEPA filtered H-Class industrial vacuum per AS / NZS 60335.2.69 *Household and similar electrical appliances – Safety: Particular requirements for wet and dry vacuum cleaners, including power brush, for commercial use*. • Filters should conform to AS 4260 *High efficiency particulate air (HEPA) filters – Classification, construction and performance* or equivalent.
Isolation	Restrict access to dust generating activities by installing temporary barricades (or similar) around relevant work areas. Ensure adequate separation distances are maintained between dust generating activities and any unprotected workers.
Engineering	Use water for dust suppression (e.g., wet down roads on a regular basis, wet soil / fill prior to excavation, install water misting devices around areas of dust generation). Fit large machinery, such as excavators and bulldozers, with positive pressure enclosed cabins. Ensure that supplied air is adequately filtered. Provide appropriate decontamination facilities for personnel (e.g., showers) and plant / equipment (e.g., washing stations). Ensure HVAC systems in offices / accommodation units include an appropriate dust filtering mechanism.

Hierarchy of Control	Example Controls
Procedures and training	Ensure that the risk of exposure to RCS arising from disturbance of soil / fill is clearly communicated during site inductions. Ensure that risk assessments and safe work method statements (SWMS) are completed for all relevant activities and that these address the risk of exposure to RCS where necessary. Ensure that risk assessments and controls are reviewed on a regular basis, and revised where necessary, in accordance with the legislative requirements. Used paved roads where possible and adopt speed limits on unpaved roads that reduce the amount of dust generated by vehicles. Plan work to minimise the frequency and duration of dust generating activities (e.g. minimise vehicle movements). Develop procedures for laundering of dusty work-wear and replacement of air filters. Develop a schedule for regular cleaning.
Personal Protective Equipment (PPE)	Select, maintain and use appropriate PPE as required during dust generating activities. Depending on the exact nature of the work being conducted PPE may include, for example, a respirator and disposable coveralls etc. PPE should comply with relevant Australian Standards such as: • AS/NZS 1715 *Selection, use and maintenance of respiratory protective devices*; and • AS/NZS 2161.1 *Occupational protective gloves – Selection, use and maintenance*. Note that workers must be fit to wear a respirator, and undergo respirator fit testing, in accordance with AS/NZS 1715.

5.6 Step 6 – Monitoring and Review

Risk assessments should be reviewed on a regular and ongoing basis to ensure that they remain relevant to the work / activities being conducted, that controls remain effective, and that legislative compliance is maintained. In this case, care should be taken to ensure that the potential for exposure is maintained below relevant occupational exposure limits and as low as reasonably practicable.

In addition, and per the Queensland *Work Health and Safety Regulation 2011* (Chapter 3, Part 3.1, Section 38), duty holders must review and revise control measures including when:

- The control measure does not control the risk it was implemented to control so far as reasonably practicable;

- Before a change at the workplace (e.g. introduction of new equipment, materials or processes) that is likely to give rise to a new or different risk to health or safety that the measure may not effectively control;
- A new relevant hazard or risk is identified;
- The results of consultation indicate that a review is necessary; and
- A health and safety representative requests a review in accordance with the WHS Regulation.

A review should also be conducted if there is an injury or a "near hit" and as otherwise determined necessary based on reasonable grounds.

5.7 Step 7 – Risk Register and Action Plan

A risk register is provided in Table 8 below. This report, and the risk register below, should be used to prepare an action plan for risk management that includes clear accountabilities.

Table 8: Risk Register

Reference No.	200466.02.R.004.Rev0
Date of Assessment	26 February 2024
Review Date	Refer Section 5.6
Description of the risk	Potential exposure of workers to RCS arising from the disturbance of soil / fill at project Campsite, Transmission Lines and Substations.
Controls	Refer Section 5.5 including Table 7
Risk Consequence	Major to Severe (refer Section 5.2)
Risk Likelihood	Unlikely to Possible (refer Section 5.3)
Risk Level	**Moderate** to **High** (refer Section 5.4)
Control Status	Control and further assessment recommended
Responsible Party	CPB Contractors Pty Ltd

5.8 **Conclusion**

This qualitative baseline screening health risk assessment considered potential worker exposure to RCS arising from the disturbance of soil / fill during the CopperString 2.0 Project. This assessment identified a **moderate to high risk level** for the following groups of workers:

- General site occupants (campsite, transmission lines, substations);
- Cleaning and grounds maintenance workers;
- Plant operators and associated workers.

Based on this assessment, proactive control / mitigation and / or further information gathering is recommended.

Controls should be identified and implemented in accordance with the hierarchy of control. A range of potential controls are identified in Table 7 of this report for informative purposes, however this does not comprise an exhaustive list of all controls that may be applied.

Further information gathering should be undertaken to develop a more detailed and reliable health risk assessment for relevant SEG's. This may include, for example, further characterisation of the workplace, SEG's and/or expected exposures.

6. Limitations

This report is provided for the exclusive use of CPB Contractors Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and / or their agents.

The work conducted herein is based on limited sampling and analytical data obtained during a previous PSI conducted by DP. The accuracy of the advice provided by DP in this report may be affected by undetected variations in conditions across the site(s) investigated, between and beyond any inspection, sampling and / or testing locations.

This qualitative baseline screening health risk assessment is limited. Further risk assessment, including literature review and / or use of semi-quantitative or quantitative assessment methods, may return a more accurate evaluation of risk that results in a different risk rating and / or identification and selection of different control(s).

While work is conducted in a professional manner, we cannot guarantee that all relevant SEG's, hazards, risks, controls or issues of concern have been identified or assessed. Risk assessment is an iterative process and, as such, additional or ongoing assessment may be required to ensure that risks are adequately identified, characterised and controlled or that compliance can be demonstrated.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for

interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

The recommendations and conclusions contained in this report do not abrogate a person of their responsibility to work in accordance with statutory requirements, codes of practice, standards, guidelines, safety data sheets, work instructions or industry best practice.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

7. Closure

We trust that the foregoing is of assistance. Please contact the undersigned if you have any questions on this matter.

Yours faithfully

Douglas Partners Pty Ltd

Tim Kulmar
Senior Associate

Reviewed by

Paul Gorman
Principal

Attachments:
Attachment A - About this Report
Attachment B - Site Plan
Attachment C - Photographs
Attachment D - CS Test Analytical Results

Attachment A

About this Report

About this Report

November 2023

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

continued next page

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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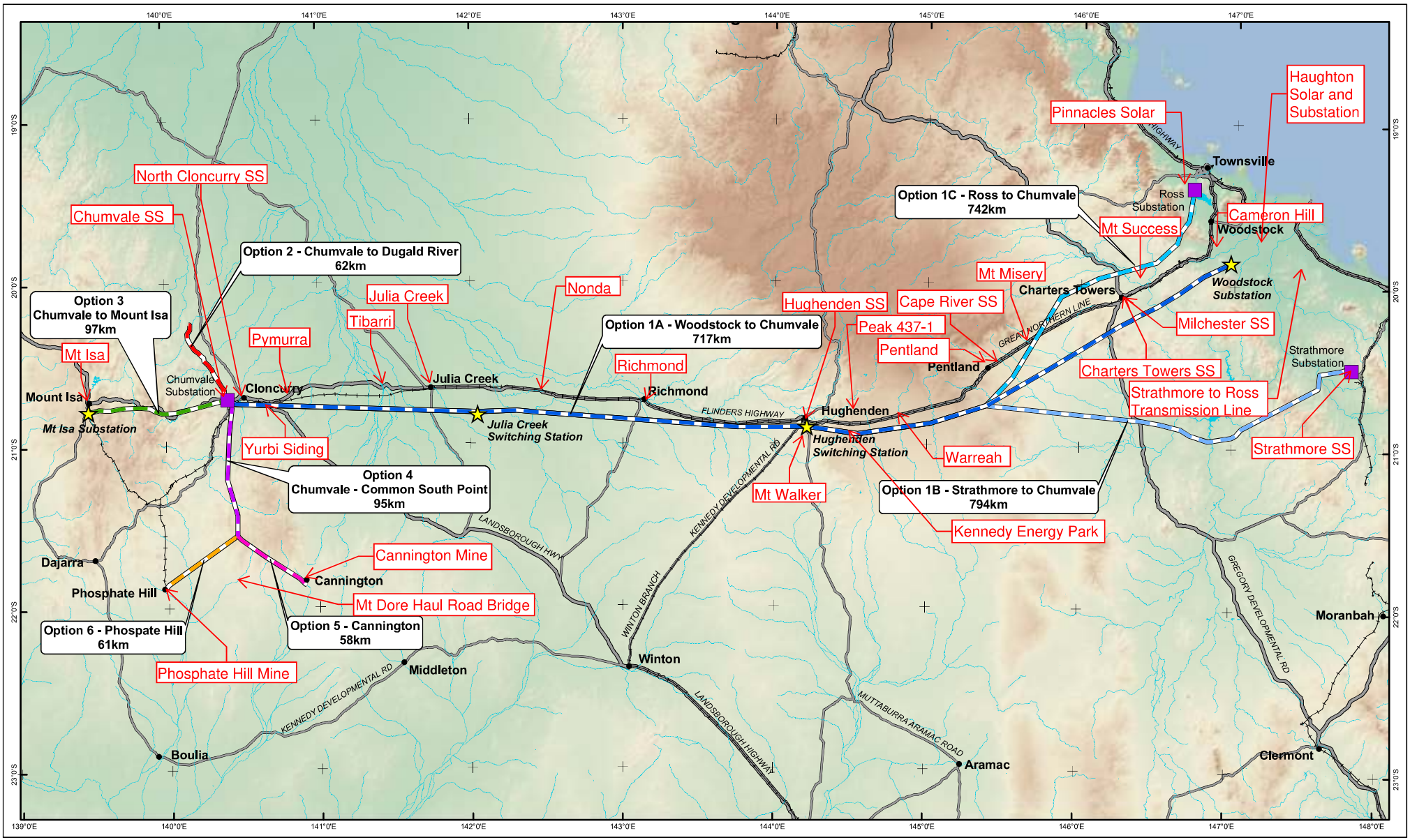
Attachment B

Site Plan



NOTES

DISCLAIMER
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

LEGEND

Copper String Routes (Rev C)
- Option 1A - Woodstock to Chumvale
- Option 1B - Ross to Chumvale
- Option 1C - Strathmore to Chumvale
- Option 2 - Chumvale to Dugald River
- Option 3 - Chumvale to Mount Isa
- Option 4 - Chumvale - Common South Point
- Option 5 - Cannington
- Option 6 - Phospate Hill

- Proposed Substation Locations
- Existing Substation
- Major Watercourse
- Railway
- Highway
- Secondary Road
- Reservoirs

0 40 80 120 160
Kilometers
Datum: GDA94
Projection: Custom MGA94 Zone 54/55

PROJECT COPPERSTRING TRANSMISSION LINK
TITLE PROJECT STAGES
DATE MAY 2010

Drawing 1

WKSP Z:\clients\HMA_Consulting\08-0004_CuString\Mapping\Workspaces\EIS\Stages.mxd
Created on 18/05/2010 by KR

Attachment C

Photographs



Photograph 1: Mount Isa Substation.



Photograph 2: Finders Substation.

Douglas PARTNERS GROUNDED EXPERTISE	**Site Photographs** **Copperstring 2.0 Project** **Woodstock to Mt Isa, QLD**	PROJECT: 200446.02 PLATE No: 1 REV: A
	CLIENT: CPB Contractors Pty Ltd	DATE: 2023



Photograph 3: Dajarra Road Substation.



Photograph 4: Pentland Campsite.

Douglas PARTNERS GROUNDED EXPERTISE	**Site Photographs**	PROJECT: 200446.02
	Copperstring 2.0 Project	PLATE No: 2
	Woodstock to Mt Isa, QLD	REV: A
	CLIENT: CPB Contractors Pty Ltd	DATE: 2023



Photograph 5: Hughenden Campsite.



Photograph 6: Richmond Campsite .



Photograph 7: Julia Creek Campsite.



Photograph 8: Cloncurry Campsite.

Douglas PARTNERS GROUNDED EXPERTISE	**Site Photographs** **Copperstring 2.0 Project** **Woodstock to Mt Isa, QLD**	PROJECT: 200446.02 PLATE No: 4 REV: A
	CLIENT: CPB Contractors Pty Ltd	DATE: 2023

Attachment D

CS Test Analytical Results

Melbourne Laboratory - H76, 63-85 Turner Street, Port Melbourne, 3207
Darwin Laboratory - 1/41 Jessop Crescent, Berrimah, NT 0828
Adelaide Laboratory - 3/224 Glen Osmond Road, Fullarton, SA 5063
Agon Environmental Pty Ltd ABN 29 167 746 063
admin@agonenviro.com.au (08) 8338 1009
www.agonenviro.com.au

Mineral Identification Report: JL4827-6

CLIENT:	Eurofins	**CLIENT CONTACT:**	07 3902 4600
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**RECEIVED IN LAB:**	14 August 2023
PROJECT:	1016151	**DATES ANALYSED:**	15 August 2023
ATTENTION:	Alana Wadsworth		

PROCEDURE:

The samples were air-dried then pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
BH49/0.2	23-Au0029828	25
BH53/0.2	23-Au0029829	20
BH54/0.2	23-Au0029830	28
BH55/0.2	23-Au0029831	25
BH56/0.2	23-Au0029832	24
BH57/0.2	23-Au0029833	34
BH58/0.2	23-Au0029834	21
BH59/0.2	23-Au0029835	31
BH60/0.2	23-Au0029836	21
BH62/0.2	23-Au0029886	18
BH65/0.2	23-Au0029887	21
BH66/0.2	23-Au0029888	30

Testing Officer: Michael Till (Senior Mineralogist)

Adelaide XRD Laboratory - 3/224 Glen Osmond Road, Fullarton, SA 5063
Agon Environmental Pty Ltd ABN 29 167 746 063
admin@agonenviro.com.au (08) 8166 2410
www.agonenviro.com.au

Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-12
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1033622	**RECEIVED IN LAB:**	12 October 2023
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	12 October 2023

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
FLR330_BH16_H2 / 0.0-0.2m	23-Oc0022675	16
FLR330_TP6_H2 / 0.0-0.2m	23-Oc0022677	16

Adelaide XRD Laboratory - 3/224 Glen Osmond Road, Fullarton, SA 5063
Agon Environmental Pty Ltd ABN 29 167 746 063
admin@agonenviro.com.au (08) 8166 2410
www.agonenviro.com.au

Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-27
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1052671	**RECEIVED IN LAB:**	14 December 2023
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	15 December 2023

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
MISTP15_H1/0.0-0.2	B23-De0023558	23
MISTP9_H1/0.0-0.2	B23-De0023562	39

Adelaide XRD Laboratory - 3/224 Glen Osmond Road, Fullarton, SA 5063
Agon Environmental Pty Ltd ABN 29 167 746 063
admin@agonenviro.com.au (08) 8166 2410
www.agonenviro.com.au

Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-28
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1063102	**RECEIVED IN LAB:**	31 January 2024
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	2 February 2024

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
DJR-BH2-K1 (0.0-0.2)	B24-Ja0044659	16
DJR-BH3-K1 (0.0-0.2)	B24-Ja0044660	7

Adelaide XRD Laboratory - 3/224 Glen Osmond Road, Fullarton, SA 5063
Agon Environmental Pty Ltd ABN 29 167 746 063
admin@agonenviro.com.au (08) 8166 2410
www.agonenviro.com.au

Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-15
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1039930	**RECEIVED IN LAB:**	2 November 2023
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	3 November 2023

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
CLO-BH3/0.0-0.2	23-Oc0074797	11
CLO-BH10/0.0-0.2	23-Oc0074804	24

Adelaide XRD Laboratory - 3/224 Glen Osmond Road, Fullarton, SA 5063
Agon Environmental Pty Ltd ABN 29 167 746 063
admin@agonenviro.com.au (08) 8166 2410
www.agonenviro.com.au

Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-13
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1033622	**RECEIVED IN LAB:**	1 November 2023
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	3 November 2023

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
Hug2 – BH5/0-0.2	23-Oc0072318	21
Hug2 – BH12/0-0.2	23-Oc0072323	14

Adelaide XRD Laboratory - 3/224 Glen Osmond Road, Fullarton, SA 5063
Agon Environmental Pty Ltd ABN 29 167 746 063
admin@agonenviro.com.au (08) 8166 2410
www.agonenviro.com.au

Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-18
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1045826	**RECEIVED IN LAB:**	22 November 2023
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	24 November 2023

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
JUL-BH3/0.0-0.2	B23-No0048200	32
JUL-BH8/0.0-0.2	B23-No0048205	31

Adelaide XRD Laboratory - 3/224 Glen Osmond Road, Fullarton, SA 5063
Agon Environmental Pty Ltd ABN 29 167 746 063
admin@agonenviro.com.au (08) 8166 2410
www.agonenviro.com.au

Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-19
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1045841	**RECEIVED IN LAB:**	22 November 2023
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	24 November 2023

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
PEN-BH3/0.0-0.2	B23-No0048304	65
PEN-BH11/0.0-0.2	B23-No0048312	41

Adelaide XRD Laboratory - 3/224 Glen Osmond Road, Fullarton, SA 5063
Agon Environmental Pty Ltd ABN 29 167 746 063
admin@agonenviro.com.au (08) 8166 2410
www.agonenviro.com.au

Crystalline Silica Report:

CLIENT:	Eurofins	**AGON REF:**	JL4827-14
OFFICE:	1/21 Smallwood Place, Murarrie QLD	**CLIENT CONTACT:**	07 3902 4600
PROJECT:	1039911	**RECEIVED IN LAB:**	2 November 2023
ATTENTION:	Zoe Flynn	**DATE ANALYSED:**	3 November 2023

PROCEDURE:

The samples were pulverised. The samples were then analysed by X-ray diffraction to identify the minerals present. Quartz was detected and its content determined by XRD measurements of the sample and of a pure quartz standard.

RESULTS:

Client ID	Eurofins ID	Crystalline Silica (quartz) content Est. Weight %
RIC-BH7/0.2	23-Oc0074637	20
RIC-BH10/0.2	23-Oc0074640	16

Powerlink QUEENSLAND | COPPERSTRING 2032

UGL CPB CONTRACTORS
UGL CPB Joint Venture

EROSION & SEDIMENT CONTROL MANAGEMENT PLAN

COPPERSTRING 2032

EDMS No : CSPW-EVN-PLN-900-000019
Revision : A02
Date : 13/06/2024

IFR

Approvals and Reviews

Erosion and Sediment Control Management Plan	
Project	CopperString 2032
Client	Powerlink Queensland Pty Ltd
Document Number	CSPW-EVN-PLN-900-000019

Revision History

Rev No.	Description of Revision	By	Checked	Approved	Date
A01	Developed for PDLA Work Contract	David Mclean	Jacinta Fuller	Matt Lennon	28/04/2024
A02	Updated in response to comments	David Mclean	Jacinta Fuller	Matt Lennon	13/06/2024

This plan has been developed by UGL CPB JV to define the management objectives and practices that are to be implemented during the execution of Contract activities. It is the private property of the JV and without their consent must not be shown or given to any competitor or third parties or used by the recipient for purposes other than those for which they are issued. Any printed documents shall be considered as uncontrolled.

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Appendix A Erosion and Sediment Control Concept Plans

1. Introduction

The purpose of the CopperString 2032 project is to connect the North West Minerals Province (NWMP) of Queensland to the National Electricity Grid. This will not only allow existing loads in the Mt Isa and Cloncurry areas to be fed from the National Electricity Market (NEM), but also provide access to new mining loads and opportunity for connection of renewable generation.

1.1 Project scope

The CopperString 2032 Project is an extra high voltage transmission system intended to connect the North West Power System (NWPS) near Cloncurry and Mount Isa to the Powerlink network and NEM at Mulgrave. Figure 1 provides an overview of the Project.



Figure 1 CopperString 2032 proposed transmission lines and substations

The CopperString 2032 Project will connect the NWMP to the NEM to reduce the cost of power supply and facilitate the large-scale development of the Hughenden wind resource and solar resources within the North Queensland Clean Energy Hub (NQCEH).

The scope of work, traversing east to west, consists of the following sections:

- Mulgrave 500/275kV Substation as the CopperString 500kV connection point to the Queensland SuperGrid and 275kV line augmentation as the CopperString 275kV connection point to the NEM
- Pentland 500kV Substation to support the North Queensland Clean Energy Hub (NQCEH) expansion and as the core for future load connections in the area
- Flinders 500/300kV Substation (Hughenden) as the core for the NQCEH
- Dajarra Road 330/220kV Substation (Cloncurry) as the core for distributions to larger load centres
- The primary CopperString transmission backbone
- Termination via the Mount Isa augmentation 220/132kV.

The scope consists of a transmission line between the above locations carrying extra high voltage power transmission at 500kV, 330kV and 220kV respectively. Substations at the abovementioned interconnecting junctions will distribute power to the NWMP and NQCEH.

The project scope, from an erosion and sediment hazard perspective includes:

- Disturbance for the purpose of construction of tower pads, brake and winch sites, access tracks, substations and other works across the project which present a hazard of erosion and sedimentation
- Significant variation across the project site encompassing subtropical climatic conditions to the east of the project and semi-arid conditions along the alignment to the west
- Significant variation in soil types across the project.

1.2 Abbreviations, acronyms & definitions

Table 1 Abbreviations, acronyms & definitions

Term	Definition
CEMP	The JV's Construction Environmental Management Plan.
Council	Local Government Authorities in the JV project area.
EIS	Environmental Impact Statement.
EMF	The JV's Environmental Management Framework.
EP Act	*Environmental Protection Act 1994.*
JV Project area	Extends from Townsville to Mt Isa across Local Government areas
MID	Ministerial Infrastructure Designation.
NEM	National Electricity Market.
NQCEH	North Queensland Clean Energy Hub.
NWMP	North West Minerals Provence.
NWPS	North West Power System
the JV	UGL CPB JV.
the Project	CopperString 2032.
CESCP	Certified Professional Erosion and Sediment Control
ESCP	Erosion and Sediment Control Plan
PESCP	Progressive Erosion and Sediment Control Plan
SAP	Sensitive Area Plan

2. Project Environmental Management Obligations

2.1 Project environmental management obligations

The Project involves construction and operation of approximately 1,000km of extra high voltage overhead electricity transmission line that will connect the Northwest power system to the state electricity grid. The project includes six (6) new substations, electricity transmission line and transmission towers every 500-600 meters (m). To support construction of the project six construction camps, site offices, laydown/delivery areas, concrete batching plants, and access tracks to the corridor and along its alignment will be provided. The project also provides for improved communications, with the installation of fibre optic cables.

The Coordinator General (CoG) for the Department of State Development, Infrastructure, Local Government and Planning declared the project to be a 'coordinated project' under *the State Development and Public Works Organisation Act 1971* (SDPWO) requiring an Environmental Impact Statement (EIS) for the Project. In September 2022, the Coordinator General provided an evaluation report (CoG Report) on the submitted EIS for the project. This report includes an evaluation of Matters of National Significant (MNES) with recommended conditions for an approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth). In November 2022, a notification of approval was granted from the Department of Climate Change, Energy, the Environment and Water (DCCEEW) (Commonwealth) under the EPBC Act with conditions specific to the Project.

The CoG report also includes recommended conditions for proposed subsequent Ministerial Infrastructure Designations for consideration under the *Planning Act 2016* (Qld) by the Queensland Planning Minister.

The CoG evaluation was based on the draft and revised EISs, submissions made, public consultation on the draft EIS and advice from relevant Australian, State and Local government agencies.

To address and comply its legislative obligations, the UGLCPB JV has prepared a Regulatory Approvals Plan (refer Fig 2) which identifies the environmental approvals applicable to the Project.

The project scope includes (but not limited to):

- Clearing vegetation and earthworks for a transmission line and ancillary infrastructure (e.g. off-easement access tracks and water sources) involving:
  - Disturbance to Matters of National Environmental Significance
  - Disturbance to Matters of State Environmental Significance
  - Interfering with protected species (flora and fauna)
  - Works within Native Title claimed areas
  - Land affected by Unexploded Ordnance (UXO)
- Constructing and operating accommodation hubs with facilities including:
  - Clearing regulated vegetation
  - Accommodation units and offices, and carparking (involving building and plumbing and drainage works)
  - Mains connection (power, water and sewerage)
  - Mobile and temporary concrete batching plants
  - Motor vehicle workshop
  - Fuel (chemical) storage
  - Water treatment, for provision of drinking water
  - Wastewater (sewage) treatment
  - Biosecurity washdown bays
- Taking water (surface and groundwater)
- Use of quarry material from commercial sources, although project specific borrow pits may be identified as an opportunity
- Crossing mapped waterways and water courses for access
- Upgrading public roads
- Working within and adjacent to rail corridors
- Disposing of contaminated soil (if found within properties listed on the Environmental Management Register (EMR)).

2.2 Relevant legislation and guidelines

2.2.1.1 State Legislation

This Plan has been developed having regard to legal obligations identified in the below regulatory framework.

- *Environmental Protection Act 1994* (EP Act)
- *Environmental Protection Regulation 2019*
- Environmental Protection (Water and Wetland Biodiversity) Policy 2019
- *Planning Act 2016* (Planning Act)
- Planning Regulation 2017 (Planning Regulation).

Environmental Protection Act 1994

All persons have a legal duty under the EP Act (s319) to take all reasonable and practicable measures to minimise or prevent environmental harm. Such harm can be caused if sediment from building sites enters (washes, blows, falls or otherwise) stormwater drains, roadside gutters or waterways. Stormwater run-off must be managed so that it is not released into waters, a roadside gutter, or stormwater drain in a state that results in the build-up of earth.

Under s443 of the EP Act, a person must not cause or allow a contaminant to be placed in a position where it could reasonably be expected to cause serious or material environmental harm or environmental nuisance (e.g. placing a stockpile adjacent to a waterway).

In addition, people who are concerned with management in a corporation have an additional duty to ensure their corporation complies with the EP Act. This means supervisors need to take reasonable and practicable steps to ensure that the people under their control do not breach environmental laws.

People who become aware of environmental harm in association with their work (e.g. loss of sediment from their site into a watercourse) have a legal duty under the EP Act to notify the Queensland Department of Environment and Science.

Environmental Protection (Water and Wetland Biodiversity) Policy 2019

The Environmental Protection (Water and Wetland Biodiversity) Policy 2019 achieves the EP Act's objective of protecting Queensland's waters through identifying environmental values for waters and wetlands and through associated water quality objectives.

These are utilised when determining environmental harm and to inform other statutory and non-statutory decisions. These water quality objectives also assist in identifying whether environmental values are protected.

These values and objectives should be utilised when determining risk of environmental harm from water releases or run-off, and when implementing appropriate erosion and sediment controls.

***Planning Act 2016* and Planning Regulation 2017**

The Planning Act and Planning Regulation are mechanisms for assessing all development within Queensland. The Planning Act establishes the process for sustainable planning and development assessment in an ecologically sustainable way. Under the Planning Act, it is a serious offence to breach development conditions, including those relating to erosion and sediment control or stormwater quality.

2.2.1.2 Standards and Guidelines

The following guidelines have been utilised in the development of this certified erosion and sediment control plan, specifically:

- The *IECA Guidelines* (the White Book)
- *Managing Urban Stormwater: Soils and Construction*, Volume 1, 4th Edition (Landcom 2006) (Blue Book) (related to the Soil Hydraulic Group)
- IECA (2008), *Appendix P: Land-based Pipeline Construction* (December 2015) addendum to *Best Practice Erosion and Sediment Control*. International Erosion Control Association (Australasia), Picton NSW.

- Carey BW, Stone B, Norman PL, Shilton P (2015). *Soil conservation guidelines for Queensland,* Department of Science, Information Technology and Innovation, Brisbane.
- Catchments & Creeks Pty Ltd (2017). *Erosion and Sediment Control – A Field Guide for Construction Site Managers.*
- Catchments & Creeks Pty Ltd (2013). *Erosion and Sediment Control Field Guide for Builders*.
- Catchments & Creeks Pty Ltd (2017). *Erosion and Sediment Control for Road Construction Part 1 – General Construction.*
- Catchments & Creeks Pty Ltd (2017). *Erosion and Sediment Control for Road Construction Part 2 – Erosion and Sediment Control Plans & Bridge and Culvert Construction*.
- Department of Environment and Resource Management (2010). *Urban Stormwater Quality Planning Guidelines 2010.*

3. Management Plan Interface

This Erosion and Sediment Control Management Plan (ESCMP) is an overarching sub-plan, informing the Construction Environmental Management Plan (CEMP) as identified below in the Environmental Management Framework (EMF).

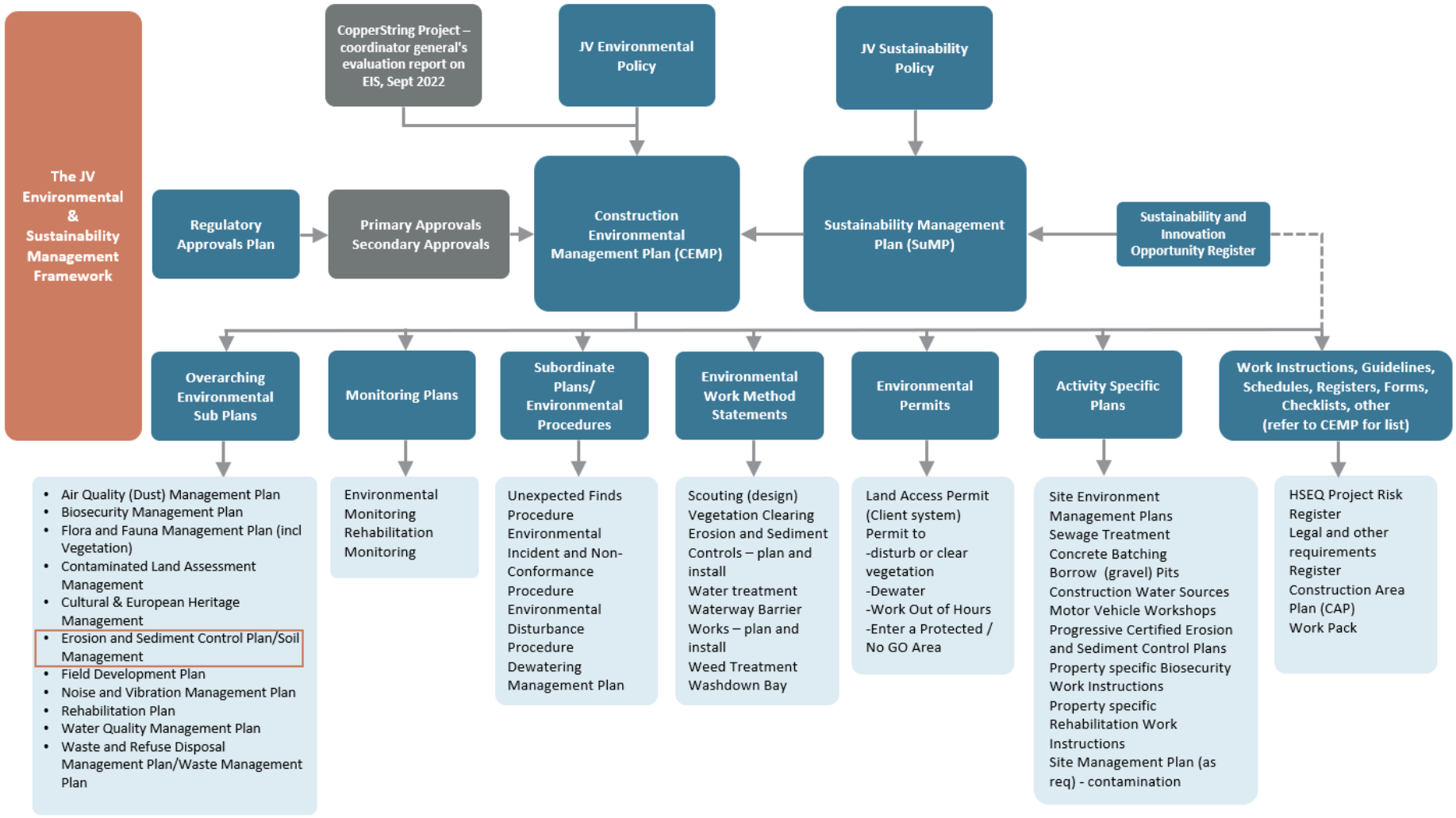


Figure 2 Environmental Management Framework – ESCMP interface

4. Erosion and Sediment Control Management Plan

4.1 Plan purpose

The purpose of this Erosion and Sediment Control Management Plan (the Plan) is to describe an overarching approach for the management and control of erosion and sedimentation associated with the development of the project site.

This Plan has been prepared to address the requirements for the Project and its compliance with relevant legal obligations and requirements.

This Plan provides overarching strategies for erosion and sediment control principles. This document provides guidance with regards to the erosion and sediment control methodology required to satisfy the contractor's responsibilities.

The control principles and management techniques outlined in this document are to be used as a guide to minimise the potential for sediment laden runoff to be discharged into the receiving environment. The development of site-specific erosion and sediment control plans should be consistent with this plan.

A Certified Erosion and Sediment Control Professional (CESCP) should be used to develop a site-specific Erosion and Sediment Control Plan (ESCP) once detailed design, construction and site establishment information becomes available. The management and mitigation strategies outlined in this Plan have been developed with reference to the International Erosion Control Association's *Best Practice Erosion and Sediment Control Guidelines* (IECA 2008), (the IECA Guidelines). The following outcomes will be delivered in the ESCPs:

- Site assessment (locality, climate, topography, waterways, soils, ecological constraints etc.)
- An identification of erosion hazards, via erosion hazard assessments, and associated control measures (including drainage and sediment controls)
- Erosion, drainage and sediment control measures
- Site inspection and monitoring
- Site maintenance
- Incident reporting and staff training procedures.

The site-specific erosion and sediment control plans will be developed progressively as the design and access for the project progress.

4.2 Plan scope

This plan addresses planned erosion hazards generated during construction and considers previous information provided in the project's Environmental Impact Statement (EIS), and requirements in the projects:

- Construction Environmental Management Plan (0643-JV-PLN-CEM-0003) (CEMP), prepared by the Joint Venture in response to the:
  - Coordinator General's Report on the EIS (date September 2022)
  - EIS Volume 3 – Appendix S – Concept Erosion and sediment Control Plan
  - Volume 2 - Chapter06 - Geology and Soils.
  - HSEQ Specification

This plan represents the latest information for the project and refines the JV's approach to erosion and sedimentation management and control. This plan does not prescribe any requirement that are inconsistent with the known requirements to date.

Table 2 Erosion and sediment control requirements

Source	Requirement	Cross Reference
HSEQ Specification, Section 9.10 Soil and Water	The Contractor must ensure no adverse impacts on water bodies as a result of soil disturbing activities. Disturbed sites rehabilitated to stable condition.	Section 4.1
	a) All soil disturbance activities are to be managed in accordance with IECA Best Practice Erosion and Sediment Control Guidelines 2008. (i) A project Erosion and Sediment Control Plan (ESCP) must be developed for use prior to construction; (ii) Upslope stormwater/runoff will be diverted, where possible; (iii) Ground disturbance must be minimised and ground dover retained where possible, to reduce potential erosion surface area; (iv) Where soil disturbance has taken place, ensure appropriate erosion and sediment controls are in place. Visual assessments must be undertaken for the presence and effectiveness of control measures preceding significant rainfall events (within 24 hours of expected rainfall while the site is unstable, weekly inspections when rainfall is not expected or the site is stable). Records of monitoring will be available on site for inspection; and (v) Progressive rehabilitation of disturbed areas must be undertaken as soon as practicable to establish ground cover (minimum 70% or equivalent to existing ground cover);	Section 2.2 Section 7.1 Section 7.3 Section 7.3 Section 7.3 Rehabilitation Management Plan
	d) Soil disturbance in erosion prone and steeply sloping areas must be minimised during clearing activities. Determine appropriate clearing methods for moderate to high erosion prone and steep areas so that the clearing methods minimise soil disturbance and potential for soil loss.	Section 7.3
CoG Report Appendix 2 Part B	Condition 33 (b)(i): Prior to the commencement of works, prepare and submit a Construction Environmental Management Plan (CEMP) to DSDILGP (infrastructuredesignation@dsdmip.qld.gov.au). The CEMP must be consistent with management measures detailed in the project EIS and, and must include/address the following:	This plan
B33(a)(i)	an Erosion and Sediment Control Plan (ESCP) developed in accordance with the Best Practice Erosion and Sediment Control Document, prepared by the International Erosion Control Association and dated November 2008, and Queensland's Construction Phase - Stormwater Management Design Objectives, prepared by the then Department of Infrastructure, Local Government and Planning and dated July 2017, that addresses/includes: • a suitably detailed description of the existing environment • a suitably detailed description of proposed clearing and the post-clearing land use • an erosion hazard and risk assessment associated with both: -- the vegetation clearing operations -- the post-clearing activities on the development site • a detailed description of the proposed erosion and sediment control measures applicable during: -- the vegetation clearing operations -- the subsequent land use - details of the proposed performance monitoring program and an ESCP review process	Section 7.1
B33(a)(v)	a dewatering management plan that establishes suitable protocols to treat or remove water from the site, should it be required during construction	Water Quality Management Plan

Source	Requirement	Cross Reference
CoG Report Appendix 4 Commitment 153a	As part of the Project, various overarching management plans will be developed and implemented in relation to the broader environmental aspects for the Project • … • Erosion and Sediment Control Plan • …	This plan, to be revised as part of the CEMP submission
CoG Report Appendix 4 – Commitment 156b	As part of the Construction Environmental Management Plan, various sub-plans will be developed and implemented in relation to the environmental aspects for the Project • …. • Erosion and Sediment Control Plan • …	This plan, to be revised as part of the CEMP submission
CoG Report Appendix 4 Commitment 158	CuString is committed to ensuring that: • Environmental harm and pollution is minimised through the active identification and management of environmental risks • Compliance is maintained with relevant environmental legislation, regulation and standards as well as project approval conditions • An environmental management system is implemented that is developed in accordance with AS/NZS ISO 14001 • Regular review and analysis of environmental performance is undertaken to identify and implement continual improvement.	This plan, to be revised as part of the CEMP submission

4.2.1 Exclusions

This plan does not address the following.

- Location specific erosion and sediment control plans within this revision
- Detailed soils assessment associated with the alignment in regard to erosion and sedimentation.

4.2.2 Limitations

This plan has been updated without:

- Access to data within and across the easement for the site
- Specific siting of the infrastructure for the associated construction sites
- Specific locations of infrastructure and the design associated with these. This information will be addressed in the site-specific erosion and sediment control plans as these are developed.

4.3 Objectives

The key objective of the Plan is to effectively manage erosion and sediment runoff to prevent environmental impact and demonstrate compliance with legal requirements in place in QLD. Key aspects include:

- Ensuring appropriate controls and procedures are implemented during construction activities to prevent impact on the environment, surface waters and groundwater associated with the Project and its construction
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements associated with the Project.

4.4 Performance/ target criteria

- Minimisation of erosion and sedimentation
- Full compliance with Commonwealth and State legislation, guidelines and strategies

- No contamination of water as a result of project soil loss from the project
- No adverse impact on visual amenity associated with erosion and sediment control.

4.5 Revising this plan

This plan will be revised as follows.

- During detailed design when locations and detailed design information is available
- During planning, clearing and grubbing works, and earthworks
- In response to audits and site inspections as ground conditions are modified or adjusted
- During construction and staging on the project to ensure currency of the plans and progressive implementation as the works progress.

5. Environmental Management Overview

The overall Environmental Management approach is discussed in this document and within the supporting indicative Erosion and Sediment Control Plans (ESCP) (Appendix A). Used together, these form the basis for effective management of erosion and sediment control.

Environmental planning documentation for construction works will also guide the development and implementation of the ESCPs. The ESCPs developed for the project will link back to the principals and the approach under this management plan, incorporating planning and design detail for the project.

Supporting documentation relating to construction methodology, staging of construction works and the implementation of environmental controls will be applicable for the broader project. This Plan provides one part of the environmental management system supporting construction of the project and should not be read in isolation of these procedures and processes.

6. Scope of works

The proposed scope of works across the Project includes:

- Vegetation trimming and clearing within the corridor selection
- Construction of transmission towers
- Construction of substations
- Construction of access tracks
- Construction of laydown areas and fly yards
- Construction of temporary construction camps.

All infrastructure relating to this Project and the anticipated ground disturbance impacts is detailed in the EIS and has been subsequently updated following collaboration with Powerlink in Table 3. Indicative locations and site plans are included in the EIS, Volume 3 Appendix I Indicative infrastructure layout and cross-section drawings. It is noted that the nature of the development does not involve significant ground disturbance or earthworks and site selection avoids steep slopes or areas of soil instability/unsuitability.

Note: disturbance footprints are indicative only and are subject to change.

Table 3 Infrastructure disturbance

Proposed infrastructure	Temporary/ Permanent	Indicative impact
Transmission line easement	Permanent	Vegetation that is within 8 m vertical and 7 m horizontal of conductor (using 44 metre area and then 45 degree angle).

Proposed infrastructure	Temporary/ Permanent	Indicative impact
		Noting that this position does not allow for tractor pull stringing of lines if helicopter stringing is not possible/ allowed
Tower footprint	Permanent (tower) Temporary (construction pad)	Minimum temporary ground disturbance footprint: 40 x 40 m tower pads (Preferred 60m x 60 m)
Access track	Permanent (easement) Temporary (off easement)	10m maximum wide ground disturbance
CEV Hut	Permanent	Design team to confirm size for these locations.
Brake and winch site	Temporary	Temporary ground disturbance footprint: every 5 km to 10 km with a 60 m x 250 m (1.5 ha) area about 100 to 200 m away from tower on each side under the transmission line. This footprint can be contained within the cleared easement if the line is straight at the site, or possibly out of easement in the direction of the pull/brake, if the site is on a bend in the transmission line (roughly every 70 km).
OPGW Sites	Permanent	10 sites (30 x 40 m). To be confirmed in detailed design.
Substations	Permanent	32 hectares 32.1 hectares
Laydown areas (transmission line)	Temporary	Temporary disturbance approximately 2 hectares
Fly yard (helicopter landing area)	Permanent (pad at substation) Temporary (construction pad)	Permanent disturbance footprint: 100 m x 100 m (1 ha) To be provided in the detailed design
Construction camps	Temporary	Temporary disturbance footprint: 8 ha To be determined in detailed design
Batch Plants	Temporary	Temporary batch plant sites to be refined in detailed design.

7. Erosion hazard and soil loss

The Universal Soil Loss Equation (RUSLE) is used as an “indicator” of potential soil loss for the purpose of deriving sediment control standards. It is important to note that RUSLE only assists in identifying relevant sediment controls and does not provide an accurate assessment of annual soil loss rates.

A RUSLE analysis has been conducted for major infrastructure associated with the project in an effort to identify necessary concept sediment control methods. Details on these concept control methods are provided in **Appendix A.**

Note that the RUSLE equations below consider 2-year, 6-hour storms, however, with the primary control being dry season construction and closure of open areas over wet periods this is seen as a conservative approach and calculated soil loss (t/ha/yr) would be significantly less given low average rainfall in dry months for the majority of the works within the easement corridor section.

Soil loss estimates for the different disturbances have been drawn from the EIS for the project. These will be progressively updated as more information becomes available for the project. The assessment of access road widening works and intersection upgrades have not been included in this revision of the plan. The specific detail for these locations will be site dependent and based on the detailed design from the traffic impact assessments undertaken on the project.

Of note the slope lengths for the transmission lines and the associated access tracks through the alignment have not been captured in this assessment. This will be updated as the access, upgrades and alignment are confirmed for the project site through each of the sections and additional information becomes available.

The initial assessment completed for the project site identifies that, with the exception of the substation areas, the remaining disturbances will require type 2 and type 3 environmental controls for management and mitigation. The table below provides indicative soil loss calculations for the project (Table 4).

Table 4 Annual soil loss results

Infrastructure	Latitude/Longitude	Approx. Area (m^2)	IFD (2-year, 6 hour storm (mm/h))	R	ASRIS Clay Content	K	LS	C	P	A (t/Ha/yr)	Sediment control type
Yorkshire CEV	-20.79834,142.05162	3000	9.91	2330	57% (Medium clay, medium heavy clay, heavy clay)	0.015	0.18	1	1.3	8	Type 3
Warreah south CEV	-20.90639,144.76306	4000	10.2	2290	6% (Sand, loamy sand or clayey sand)	0.025	0.18	1	1.3	13	Type 3
Selwyn CEV	-21.53241,140.45462	3000	8.69	1750	15% (Sandy loam)	0.03	0.18	1	1.3	12	Type 3
Pentland south CEV	-20.61930,145.60581	3000	10.7	2500	15% (Sandy loam)	0.03	0.18	1	1.3	18	Type 3
Nonda CEV	-20.82406,142.69489	4000	10	2210	57% (Medium clay, medium heavy clay, heavy clay)	0.015	0.19	1	1.3	8	Type 3
Gilliat CEV	-20.78973,141.34522	3000	9.67	2020	57% (Medium clay, medium heavy clay, heavy clay)	0.015	0.18	1	1.3	7	Type 3
Charters Towers south CEV	-20.29986,146.18415	3000	11.2	2720	23% (loam, silty loam or sandy clay loam)	0.055	0.18	1	1.3	35	Type 3
Barabon CEV	-20.88601,143.43014	3000	9.83	2150	57% (Medium clay, medium heavy clay, heavy clay)	0.015	0.18	1	1.3	8	Type 3

Infrastructure	Latitude/Longitude	Approx. Area (m^2)	IFD (2-year, 6 hour storm (mm/h))	R	ASRIS Clay Content	K	LS	C	P	A (t/Ha/yr)	Sediment control type
Woodstock substation	-19.92814,147.05280	362000	16	5830	22% (loam, silty loam or sandy clay loam)	0.055	0.58	1	1.3	242	Type 1
Selwyn substation	-21.78525,140.70318	360000	7.97	5830	19% (Sandy loam)	0.03	1	1	1.3	59	Type 3
Phosphate Hill substation	-21.87857,139.98047	10000	8.33	1520	38% (Light clay or light medium clay)	0.025	0.24	1	1.3	13	Type 3
Mt Isa substation	-20.77354,139.49019	70000	9.36	1630	8% (Sand, loamy sand or clayey sand)	0.025	0.24	1	1.3	15	Type 3
Flinders substation	-20.87978,144.16836	858000	9.85	1970	61% (Medium clay, medium heavy clay, heavy clay)	0.015	0.24	1	1.3	10	Type 3
Dajarra Road substation	-20.74978,140.40919	820000	10.1	2150	15% (Sandy loam)	0.03	1	1	1.3	88	Type 2
Cannington substation	-21.85713,140.91830	10000	7.82	2250	53% (Medium clay, medium heavy clay, heavy clay)	0.015	0.24	1	1.3	7	Type 3

- K factor derived from Table E4 (Book 2, Appendix E, IECA, 2012).
- LS derived from Table E3 (Book 2, Appendix E, IECA, 2012).
- A C-factor with no cover has been adopted for the assessment

8. Identify & Assess

8.1 Soils, rainfall, landform, and drainage

8.1.1 Soils

The soil characteristics for the site are summarised below. The assessment incorporated a review of the soil mapping across the project by soil type. The soil types vary significantly across the project with the soils in Stage 1 and Stage 2 being predominately Vertosols, soils in Stage 4 being predominately Kandosols and Chromosols and Stage 3 being predominately Rudosols and Ferrosols.

A map of the soil types across the project is provide in Figure 3. The soil types directly affect the erosion risk from construction activities and provides a representative high-level assessment of erosion hazard associated with the project. The risk assessment has incorporated the period climate conditions with the soil types.

Due to restrictions on access during the wet season the main focus of managing and mitigating risk is the focus on construction and disturbance during the dry season to mitigate the key erosion hazards associated with the project site.

Soil type and the associated erosion risk is summarised below in Table 5. A summary of the soil types is provided in Table 6. The highest risk associated with the soil types are the Sodosol and the Vertosol which have specific properties which make them subject to a high erosion risk based on the dispersive or sodic nature of these soil types, significantly effecting erosion hazard. The Vertosol through the range lands are know as the black soils, have high erosion risk and are vulnerable to gully erosion. These are through stage 1 and stage 2 of the project.

Table 5 Soil type erosion risk

Soil Description	Tower Codes		Season	
	From	To	Wet	Dry
SODOSOL	PLQ-MLG 1	MLG-PTL 8		
RUDOSOL	MLG-PTL 8	MLG-PTL66		
CHROMOSOL	MLG-PTL66	MLG-PTL 241		
KANDOSOL	MLG-PTL 241	MLG-PTL 317		
SODOSOL	MLG-PTL 317	MLG-PTL 330		
KANDOSOL	MLG-PTL 330	PTL-FLR 171		
VERTOSOL	PTL-FLR 171	PTL-FLR 209		
KANDOSOL	PTL-FLR 209	PTL-FLR 233		
VERTOSOL	PTL-FLR 233	FLR-DJR 693		
FERROSOL	FLR-DJR 693	DJR-MTI 23		
RUDOSOL	DJR-MTI 23	DJR-MTI 47		

*Erosion risk based on soil type

High	
Medium	
Low	

Figure 3 Soil types on project

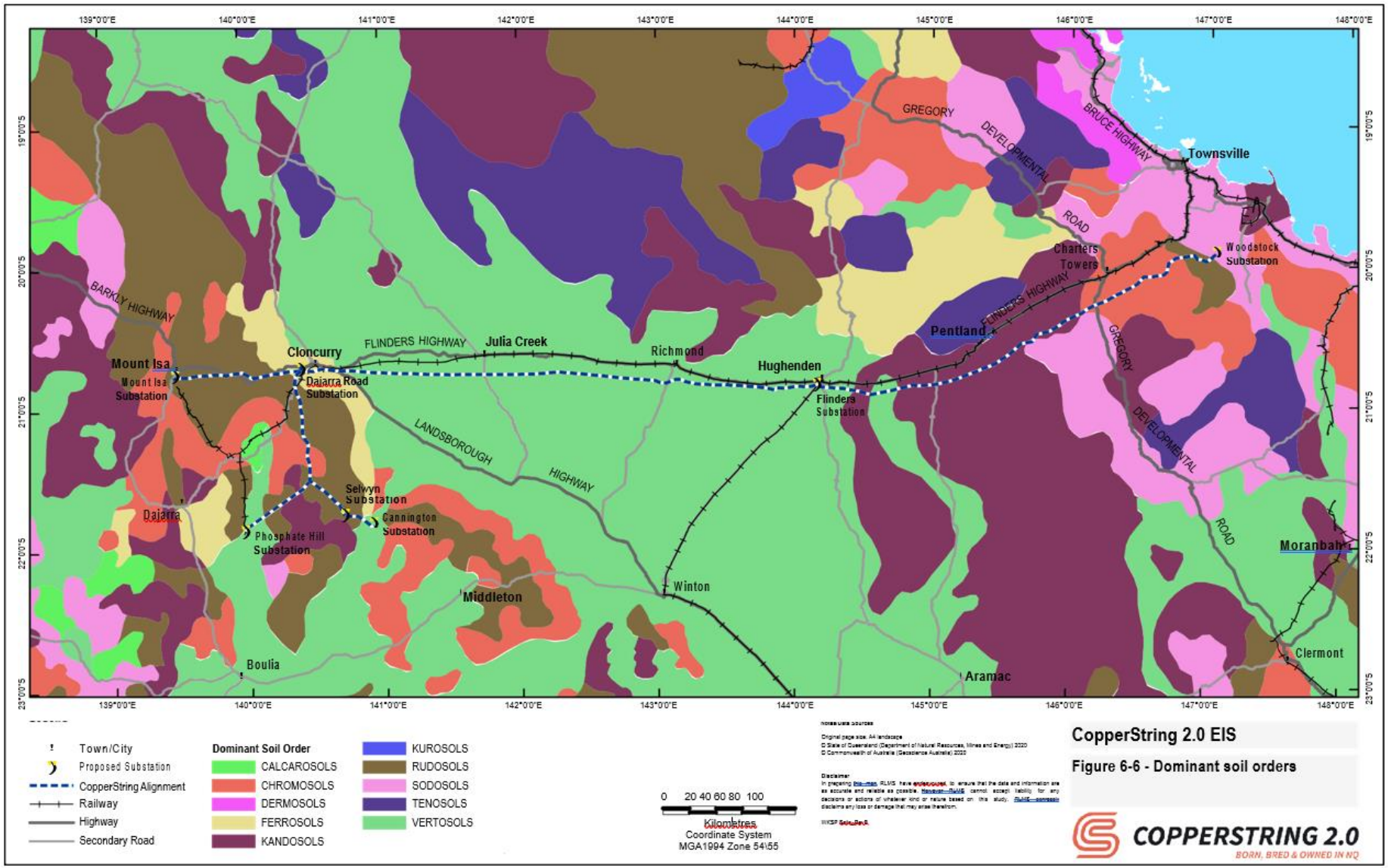


Table 6 Soil description

ASC Soil type (Isbell, 2016)	Description	Chemical properties	Physical properties
Rudosols	Either deep layered alluvial soils (stratic) or shallow stony soils (leptic), associated with watercourses	Low salt levels	Little to no shrink swell clays, not generally dispersive
Chromosols	Strong texture contrast with surface loamy soil and clay subsoil. May be located on flat alluvial areas and on sloping land	Non-sodic, slightly acidic to slightly alkaline clay subsoils Can have high salt levels particularly on lower slopes	Little to no expansive clays, generally not dispersive but rill, sheet and stream bank erosion may occur
Kandosols	Sandy loam in the surface which may increase in clay content with depth to sandy light clay in the subsoil	Neutral to acidic, very low salt levels	Porous and friable, no shrink swell clays, generally not dispersive however likely to produce dust
Sodosols	Strong texture contrast	Sodic and alkaline	Little to no expansive clays, subsoils are often dispersive with high erosion risk
Vertosols	Cracking clay soils of uniform texture	pH is neutral to strongly alkaline, high salt levels particularly on lower slopes	Contain shrink-swell clays, often dispersive subsoils with high erosion risk
Ferrosols	High in free iron oxide in the subsoil. Lacking texture contrast	High clay content	Stable with strong structure

8.1.2 Slope

Slopes across the Project range in steepness to 12%. The focus for these steeper areas is progressive stabilisation and maintenance of ground cover until disturbance is required. This is shown in the concept control plans in Appendix A. A key focus during construction is maintaining slope brakes across the corridor footprint to slow the velocity of flow, reduce erosion and minimise sedimentation.

Where the embankments for the transmission towers start to come up, a focus on the use of batter shoots along the fill is proposed with the use of energy dissipation at the base of these structures. Standard details are provided in the concept control plans in Appendix A, specific sites will be developed dependent on the cut and fill design. Additional controls will be required at steeper creek crossings to manage and direct flows, divert clean water and provide energy dissipation at the base of these locations to minimise erosion and sedimentation.

8.1.3 Soil erodibility factor (K-Factor or K)

The K factor is a component of the Revised Universal Soil Loss Equation (RUSLE), used in calculating the capacity of sediment basins and the erodibility of the soils. K is a measure of the susceptibility of soil particles to detachment and transport by rainfall and run-off. The K factor of the soils highlights the highly erodible nature of the soil. Soil texture is the principal component affecting K, but soil structure, organic matter, profile and permeability also contribute. The K factor provided under the EIS of 0.055 to 0.015 is based on the soil types across the project site and indicates a significant change representative of the significant footprint of the project and the surrounding landforms and environment.

As a strategy to effectively manage the sodicity of the subsoils application of 2.5 tonnes/hectare (https://www.dpi.nsw.gov.au/ data/assets/pdf_file/0007/127258/Does-my-soil-need- gypsum.pdf) of gypsum will be investigated for use through the anticipated sodic soils towards the western section of the alignment to help manage the dispersion risk of the soils.

Soil testing although limited will be expanded as the project progresses. The use of ameliorants for treatment of soils through different environments will be considered where slaking or sodic soils are encountered. These are more likely through the project site where the Vertosols and Sodosols are encountered across the lease corridor.

The key principle for managing erosion, specifically for higher risk soil types through the project, will be the maintaining of groundcover and the minimisation of exposure of subsoils on the project site.

8.1.4 Topography

The Project is situated within six different bioregions that are characterised by broad, landscape-scale natural features and environmental processes that influence the functions of ecosystems. Bioregions capture large-scale geophysical patterns across the land.

The topography across the corridor selection varies from relatively flat to hilly terrains.

Preliminary calculations for the average slope of disturbance area across each section were determined by considering topographic long sections (Google Earth):

- Woodstock to Dajarra – 0.68%
- Dajarra Road to Cannington Mine – 1.45%
- Dajarra Road to Mount Isa – 5.41%
- Phosphate Hill Mine – 0.44%.

These slope calculations will be assessed further during detailed design and are only averages for these areas and not representative of site-specific locations on the project site. Of note the terrain towards the coast and towards Mt Isa are likely to have more frequent steeper terrain, although the variability through the footprint will be site specific with changes in the topography directly effecting the erosion hazard.

8.1.5 Soil hydrologic group

Soil Hydrologic Groups are considered in *Appendix F of Managing Urban Stormwater: Soils and Construction, Volume 1* (Landcom 2006) and has been derived from the IECA guidelines, considering the infiltration and permeability characteristics of the soils. The Soil Hydrologic Groups are used in the sizing and design for sediment basin construction. The project has identified a soil hydraulic group of D through stage 1 and stage 2. The soils through stage 3 and stage 4 will be further investigated for the project as the works progress and the alignment through these areas are finalised.

The soil hydraulic Group D has very high runoff potential. Water moves into and through these soils very slowly when thoroughly wetted. Usually, they consist of soils:

- That are fine textured (clay), poorly structured, surface-sealed or have high shrink swell properties; and / or
- With a permanent high-water table; and / or
- With a layer near the surface that is nearly impervious.

  (Managing Urban Stormwater: Soils and Construction, Volume 1 (Landcom 2006) and IECA, 2012, Appendix A, Table A13).

8.1.6 Soil loss

Soil loss from the construction works is dependent on disturbance, soil type, slope length and erodibility based on the location and the climatic conditions. Based on the preliminary project assessment the area of disturbance will have a significant impact on the type and approach to the management controls on the project.

The key approach will focus on minimising ground disturbance and maintaining ground cover and where this is not possible reducing sediment movement. The nature of the works will incorporate management and minimisation of erosion focusing on key principals incorporating:

- Minimisation clearing
- Plan and establish controls early
- Divert clean water
- Capture and treat site water
- Establish groundcover were possible
- Revegetate as soon as possible, and progressively.

These principles focus on the key objectives of reducing erosion and minimising sediment movement.

8.1.7 Rainfall

The weather in the area of the project generally shows higher rainfall during the summer months and lower rainfall during the winter months of the year. Data obtained from the Bureau of Meteorology identifies monthly rainfall is highest in the period January to April with the rainfall steadily decreasing over winter with the lowest rainfall during July, August and September in the cooler months of the year (refer to Table 7). The number of rain days encountered over the period also show the highest period of rain days over the wet season for the project area.

The program for the site works is intended to focus on the construction during the dry periods from April to December. The stage 1 and stage 2 works will be directly affected by the shrink and swell soils associated with the project alignment where black soils are encountered. These soils significantly constrain access during construction. The waterways through stages 1 and 2 and the associated braided waterways will further impact on the access through these areas of the project as this is developed.

The areas to the west and east through stages 3 and 4 will be less impacted by these soil constraints but other site-specific impacts including slope and terrain will have a significant impact. Prioritising the work during the dry period is required to allow for program and the delivery of the project.

The rainfall for the Project shows a higher R-factor for stage 4 of the project (5830) and is in an area with more frequent and steeper slopes on site resulting in a corresponding higher soil loss value for these construction works. The surrounding landform has a strong influence on rainfall, with the higher rainfall occurring east near the coastal range.

The R-factor from the remaining stages of the project are substantially lower as the works progress into the semi-arid rangelands to the west of the project and during the dry will have a substantially lower soil loss risk associated with these areas of work.

Rain forecast review will be part of the supervisors regular checks to monitor the weather particularly during the warmer months of the year. Works within the creek lines and associated with the waterway barrier works will be prioritized for the cooler months of the year when weather conditions are more stable.

Table 7 Average monthly rainfall

Monitoring station	Average monthly rainfall (mm)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ayr DPI Research Station	221.6	234.5	153.4	46.8	40.2	24.0	15.2	15.3	9.8	26.3	44.4	98.7
Townsville Aero	269.2	304.6	193.7	64.5	32.9	20.6	14.7	15.5	10.2	24.1	57.1	125.3
Woolshed	273.9	328.3	151.3	63.4	28.2	29.4	22.6	12.8	14.0	29.3	59.2	99.1
Charters Towers Airport	151.9	144.2	76.4	26.2	22.8	20.1	20.1	15.0	9.1	17.7	61.5	77.7
Hughenden Airport	118.3	86.5	32.6	19.2	5.0	20.4	13.2	7.8	7.9	15.4	44.3	63.0
Richmond Post Office	122.1	104.9	62.1	22.0	14.7	15.3	9.9	4.1	6.2	15.7	30.6	69.6
Julia Creek Airport	130.2	109.9	76.9	12.4	8.0	16.1	8.5	3.8	2.9	10.1	27.7	56.7
Cloncurry Airport	161.6	104.5	77.9	16.6	7.0	7.5	3.5	3.2	6.0	16.4	32.7	72.4
Mount Isa Aero	116.2	101.9	65.4	13.6	11.9	6.4	5.8	3.4	8.1	18.2	37.7	71.2

Table 8 Average number of rain days

Monitoring station	Average number of days of rain > 1 mm											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ayr DPI Research Station	9.6	10.3	7.9	3.5	3.1	2.4	1.6	1.6	1.2	2.2	4.0	5.6
Townsville Aero	11.6	12.6	9.7	5.3	3.6	2.4	1.9	1.4	1.3	2.8	4.8	7.2
Woolshed	11.7	12.4	9.2	5.5	3.9	3.9	2.4	1.5	1.9	3.0	6.1	6.5
Charters Towers Airport	8.8	8.5	6.2	3.3	2.7	2.7	1.7	1.2	1.3	2.1	4.7	5.6
Hughenden Airport	7.9	5.9	3.8	1.4	0.9	1.4	0.9	0.7	0.8	1.8	3.8	4.8
Richmond Post Office	7.8	6.7	4.2	1.7	1.2	1.1	0.9	0.6	0.7	1.8	3.2	5.4
Julia Creek Airport	8.5	6.1	4.1	1.0	0.8	1.1	0.7	0.6	0.5	1.4	2.9	4.7
Cloncurry Airport	8.2	6.4	4.0	1.4	0.8	0.7	0.5	0.4	1.0	1.7	3.6	5.3
Mount Isa Aero	7.9	7.1	4.1	1.4	1.2	0.7	0.6	0.5	0.9	2.3	3.9	5.8

9. Plan Implementation Approach

9.1 Erosion and sediment control

An initial assessment has been completed for the project regarding the implementation of erosion and sediment controls across the project. The key components of construction which encompass the linear infrastructure construction approach identified in Table 3 are summarised below:

- Easement construction access track
- Line of site clearing
- Waterway crossings
- Road access widenings, local road and access track upgrades.

These aspects align with the linear construction approach adopted for the project and present a significant disturbance footprint across the length of the corridor of the project. A series of concept erosion and sediment control designs are provided in Appendix A to provide the approaches to these types of works on the project. These do not take into account site specific aspects associated with these locations and these will be reviewed, adjusted and modified according to the topography, soil types and sensitive areas encountered for a specific location.

The anticipated controls required for the project works are identified as being type 2, and type 3 controls except where larger disturbances are encountered for substation construction, camp construction or alternately other disturbances associated with borrow sites if required in stage 3 or stage 4.

Erosion and sediment control plans (ESCPs) will be developed for key stages of the project works and certified by a qualified CPESC. These stages are:

- Clearing and Grubbing
- Earthworks
- Completion.

These plans will be incorporated within the work packs applicable to the site works and will link to the Site Environment Plans (SEP) applicable to the specific area of works. As works progress the plans may require regular updates depending on the scope and changes. Where changes are required the ESCPs will be updated with the required change and included in the work pack as a redline update.

A CEPESC will be available to undertake a monthly review of the redlines and verify the necessary changes on the plan at that time. Significant changes that will require a CEPESC certification prior to the works where there is a significant change in soil loss, altering the required control from a Type 1 or 2 to a type 3.

9.1.1 Construction activities

9.1.1.1 Compound and substation construction

Given the size of these facilities a site-specific ESCP will be developed for these encompassing the specific detailed design, the drainage and the associated sensitive areas on the project.

These will be developed as the detailed designs are finalised. The site specific ESPCs will support the sensitive area plans for the specific site and link to the drainage and design of the facility.

9.1.1.2 Mitchell grasslands

The Mitchell grasslands are the predominant vegetation through Stage 1 and Stage 2. They are predominately open plains characterised by moderate changes in topography across the ephemeral creek systems, with eucalyptus open woodlands and acacia open woodlands generally associated with these ephemeral waterways.

The project has developed concept erosion and sediment control plans for these areas encompassing:

- Waterway crossings of ephemeral creeks

- Access track and line of site clearing
- Works on hilly terrain.

The key focus of works across the four stages will focus on construction works taking place in the dry season to minimise the erosion hazard.

9.1.1.3 Waterway crossings

Waterway crossings across the project will be designed and developed in accordance with the *Accepted Development Requirement Code* (ADR Code). This design will then link to the erosion and sediment control plan for the crossing location. The controls for these crossings are provided in a concept plan in Appendix A. This concept will be further refined as more detail becomes available. The intent is to develop a series of standard details to be applied along the project corridor to protect the waterway crossings as these are developed and operated.

A review will be undertaken of the developed concept design approach for these crossings on a site-specific basis with updates, modifications or changes specific to that waterway crossing where these are required to address the erosion hazard risk.

9.1.1.4 Stage 3 works

The area of the alignment through stage 3 has generally a lower erosion hazard profile with lower rainfall and more stable soil types of Rudosols and Ferrosols. Parts of this section of the alignment are hilly in context with rocky outcrops through the project footprint.

9.1.1.5 Stage 4 works

This area of the project corridor is characterised by hilly terrain with more vegetation associated with the higher rainfall through the area.

9.1.1.6 Drainage

The project crosses a significant range of waterways along the lease corridor. There are in excess of 269 mapped and unmapped waterways. These waterways are predominately ephemeral river and creek systems.

The creeks and waterways are predominately located in the Woodstock-Flinders section of the project but are a significant constraint across the alignment corridor. The types and nature of these waterways will be managed on a site-specific basis taking into account the crossing location, access and associated constraints.

The focus of the waterway crossings will be to provide adequate clean water diversion to prevent concentrated erosive flows from the access tracks into these waterways and to minimise flow velocities down to the creek through the use of slope breaks and sumps for capture and treatment.

The primary focus of the Plan will be to establish clean water cross drainage and longitudinal high side clean water drainage as soon as possible in the construction process. Stabilised access across the waterways will be established for the purpose of compliance with the Accepted Development Requirements under the code for waterway barrier works and regularly maintained to prevent mud and silt tracking across the waterway crossing.

9.2 Erosion control

Erosion is the loss of soil and sediment. Rainfall and runoff are the primary catalyst for erosion to occur which is exacerbated depending on the nature of the soil, the slope and the general topography of the work areas.

Erosion prevention is a preferred option over sediment control where this is practicable. The control of raindrop and sheet erosion minimises the amount of sediment that is mobilised during a rainfall event. A focus on progressive stabilisation particularly of steep slopes is essential to the minimisation of erosion.

Table 9 contains measures the project will adopt to minimise soil erosion impacts during construction.

9.3 Sediment management

Sedimentation is the deposition of soil and sediment particles entrained in suspension during erosion. Increased sedimentation of waterways can smother benthic habitat and organisms, and can increase levels of nutrients, metals and other potential toxicants that attach to the sediment particles. The dispersible nature of some fine-particle silts and clays often results in these particles remaining in suspension for longer periods of time. Accordingly, there is a greater risk of sediment loads spreading considerable distances downstream where dispersible soils are present.

Table 9 contains measures the project will adopt to minimise soil sedimentation impacts during design and construction.

Table 9 Erosion and sediment controls

Ref	Control	Accountability	Source
Planning and Design			
ESC 1	Wherever possible clearing is to be minimised for the project and where an area is not programmed to have work commencing, to maintain the ground cover	Project Engineers	Best Practice
ESC 2	Erosion and Sediment Controls (ESC) shall be designed (stability, location, type and size), constructed, operated and maintained in accordance with the approved drawings, ESCP or Site Environment Plan and relevant, local guidelines, including: • Best Practice Erosion and Sediment Control (International Erosion Control Association, November 2008) • Queensland's Construction Phase - Stormwater Management Design Objectives (Department of Infrastructure, Local Government and Planning, July 2017).	Construction Manager Site Supervisor	Recommended Requirement B28 Recommended Requirement B33a(i) Commitment C83
ESC 3	ESC will be installed prior to (or immediately upon) any disturbance to vegetation or soil. These controls will remain in place until revegetation, stabilisation or hard scaping has occurred. If these controls require maintenance notify your supervisor.	Site Supervisor All	Manage Soil and Water (CPBEMS)
ESC 4	In accordance with standard construction practices weather forecasts shall be used to guide work activities undertaken on-site. Forecasts shall be checked at the start of each day and prior to undertaking new work activities that may be affected by rainfall or adverse weather. Where weather forecasts predict conditions that may pose an environmental risk, site environmental controls shall be inspected and secured to reduce erosion and sediment control impacts.	Site Supervisor	Best Practice, HSE Specification, OCG Report.
ESC 5	So far as reasonably practical cleared areas will be kept to a minimum and will be progressively rehabilitated/revegetated as they become available in accordance with the Rehabilitation Management Plan.	Construction Manager	Erosion and Sediment Control (UGLEMS) Manage Soil and Water (CPBEMS)
ESC 6	Soil disturbance in erosion prone and steeply sloping areas will be minimised during clearing. Determine appropriate clearing methods for moderate to high erosion prone and steep areas so that the clearing methods minimise soil disturbance and potential for soil loss.	Construction Manager	HSE Specification
ESC 7	Clean water diversions will be installed prior to the commencement of work.	Site Supervisor	Commitment C17

Ref	Control	Accountability	Source
			Erosion and Sediment Control (UGLEMS) Manage Soil and Water (CPBEMS)
ESC 8	Sediment laden water (dirty water) captured onsite will be preferentially reused e.g. dust control.	Site Supervisor	Manage Soil and Water (CPBEMS)
ESC 9	No stockpiles will be located within 3 m of watercourses. Stockpiles will be protected from overland flow and covered or stabilised to minimise wind and water erosion	Site Supervisor	Erosion and Sediment Control (UGLEMS) Manage Soil and Water (CPBEMS) HSE Specification
ESC 10	Access tracks will be stabilised with aggregate, road base or other suitable quarry material and regularly maintained.	Site Supervisor	Erosion and Sediment Control (UGLEMS)
ESC 11	Shaker grids will installed at entry/exit points, where required	Site Supervisor	Erosion and Sediment Control (UGLEMS)
ESC 12	If dispersible soils are disturbed, sediment basins may be required to capture and treat sediments in accordance with the ESCP. Basin design and treatment options to be determined by an appropriately trained professional	Site Supervisor	Erosion and Sediment Control (UGLEMS)
ESC 13	Water transfers / movement around site and discharged from site will be undertaken in accordance with the project's Dewatering Management Plan (refer to the Water Quality Management Plan).	Construction Manager	Recommended Requirement B33a(v) Manage Soil and Water (CPBEMS)
Construction			
ESC 14	Wherever possible clearing is to be minimised for the project and where an area is not programmed to have work commencing, to maintain the ground cover	Project Engineers	Best Practice
ESC 15	Maintain all erosion and sediment controls until the upstream catchment areas are stabilised for the work area. Ensure silt and sediment traps have 70% capacity maintained at all times.	Design Manager	Commitment C80
ESC 16	Sediment basins are the last line of control for sediment capture prior to release offsite. They are to be designed and constructed in accordance with the Blue Book where soil loss exceeds 150t/h/year.	Design Manager	Commitment C85
ESC 17	A stabilised rock pad with an adjacent silt and sediment trap is to be used at either end of the project corridor. Vehicle movements throughout the site will be minimised when the site is wet. The	Project Environmental Representative	Commitment C153b

Ref	Control	Accountability	Source
	rock pad will be a minimum of 14m in length to allow for a full tyre rotation to be completed.		
ESC 18	Sediment tracked onto public roads in / near town centres will be removed by sweeper trucks where this is identified as occurring at the exit locations from the work site.	Project Environmental Representative	Commitment C17 Commitment C65 Manage Soil and Water (CPBEMS)
ESC 19	The approach for stabilisation of batters and the use of gypsum on the subsoils will support the minimisation of erosion. Wherever possible ground cover is to be maintained.	Project Environmental Representative	Commitment C50
ESC 20	Basins will have a minimum 70% of operational capacity always maintained during the construction of the project.	Site supervisor	Derived from IECA and the Blue Book
ESC 21	Establishment of adequate groundcover as soon as possible within floodplains and areas prone to flooding.	Site supervisor	Best Practice
ESC 22	As noted in the standard detail, as cut batters are formed these should be progressively stabilised. This will have a significant benefit in preventing erosion and in minimising rework.	Site supervisor	Best Practice
ESC 23	Capacity will be restored to all sediment basins within the 5-day management period.	Site supervisor	Derived from IECA and the Blue Book
ESC 24	Sediment basins will be retained until a C- Factor of 0.05 is reached in its catchment or an alternative rehabilitation is achieved as per the rehabilitation management plan	Site supervisor	Best Practice &rehabilitation management plan
ESC 25	Temporary creek and waterway crossings will be designed and constructed in compliance with the Accepted Development Requirements Code.	Site supervisor	*Fisheries Act 1994*
ESC 26	Clean water diversions will be designed and constructed prior to the commencement of construction to allow water through the site prior to substantive construction occurring.	Site supervisor	Best Practice
ESC 27	Temporary cross drainage structures will be excavated prior to significantly raising the embankment formation in affected areas.	Site Supervisor	Best Practice
ESC 28	Scour protection will be installed within the creek floodplain to prevent erosion during construction of the diversions and crossings as required.	Site Supervisor	Best Practice
ESC 29	Inspect all controls prior to anticipated rainfall and before the end of the day following rainfall during normal hours, or if rainfall is outside of work hours, within 24hrs of the rainfall event that exceeds 10mm of rain in a 24hr period, where access permits (and within a disturbed catchment).	Site Supervisor	Best Practice
ESC 30	The treatment, testing and discharge of sediment basins will be monitored. And assessed against the discharge criteria as provided in the Water quality Management Plan	Site Supervisor	IECA and the Blue Book
ESC 31	Environmental training on erosion and sediment control will be provided to workers on the project site during site inductions and where appropriate additional training provided for supervisors,	Site Supervisor	Best Practice

Ref	Control	Accountability	Source
	superintendents and engineers which manage the implementation of the ESCPs.		
ESC 32	All materials utilised in the construction works within the floodplain for waterway barrier works will be removed and stored outside of the flood plain above the 1 in 5 year flood event.	Site Supervisor	IECA and the Blue Book
ESC 33	All servicing and refuelling will be undertaken a minimum of 50 m from the nearest water way and outside of the floodplain except where the plant cannot move from the floodplain due to the type of equipment (i.e piling rig). To mitigate the risk for plant that is unable to be moved portable bunds and drip trays will be utilised to mitigate potential risks of spills and contamination.	Site Supervisor	Best Practice
ESC 34	Spill kits will be supplied and maintained on site where chemicals are stored or used. Spills will be contained immediately	Site Supervisor	Best Practice
ESC 35	All sediment basins and discharge points will be clearly identified.	Site Supervisor	IECA and the Blue Book
ESC 36	All dewatering from sediment basins will be monitored to ensure the discharge does not exceed the criteria set out in the Water Quality Management Plan.	Site Supervisor	IECA and the Blue Book

9.3.1 Basin design criteria

Sediment basins will be sized in accordance with the *Best Practice Erosion and Sediment Control guidelines* (IECA, 2008). The sizing of the basins where these are required, is dependent on the sizing and location of these on the footprint. These will be sized once the project footprint design is finalised for the larger disturbances associated with the construction of a camp or a substation.

10. Rehabilitation

The Project construction will result in extensive loss of vegetation and groundcover in work areas. In order to minimise potential impacts to the surrounding environment and downstream ecological communities an effective approach to rehabilitation is required. The objectives of rehabilitation are primarily two-fold; these are to:

- Ensure successful establishment of revegetation through appropriate controls and procedures and avoid or minimise potential adverse impacts to the environment.
- Ensure the successful completion of the Project with a stabilised site that has self-sustaining vegetation cover that minimises the need for maintenance and protects the construction works.

To ensure successful rehabilitation the impacts associated with the construction of the Project need to be identified and appropriate remediation processes implemented. Impacts arising from construction may include:

- Compaction of topsoil
- Compaction of subsoils
- Weed contamination of topsoil
- The need for establishment of revegetation during unsuitable climatic conditions for the area
- Damage to riparian vegetation areas, potential habitat and connectivity corridors.

To address the rehabilitation there are two key strategies

- Short term stabilisation
- Areas including topsoil stockpiles and waterways will have a Maximum C-factor of 0.15 after 20 days of inactivity or sooner based on risk.

Of note areas in Stage 4 have sufficient rainfall to maintain a viable cover crop to achieve the C-factor. For areas within the semi-arid Rangelands this may not be able to be achieved and a timeframe of 40 days is provided for these areas outside of the wet season through Stages 1, 2 and 3.

Where this is not possible or practical sediment controls will be incorporated and established up until the wet season where stabilisation will be undertaken prior to the wet season.

10.1.1.1 Topsoil stockpiling

Topsoil stockpiling is critical to ensuring that physical, chemical and biological characteristics of the soil are maintained. All of which are vital to successful germination after revegetation. The key points to implement are described below:

- Place stockpiles more than 5 metres from existing vegetation, concentrated water flow, roads and high hazard areas
- Construct on the contour where possible as low, flat, elongated mounds
- Where there is sufficient area, topsoil stockpiles shall be less than 2 meters in height with batters no steeper than 2:1
- Where they are to be in place for more than 20 days, stabilise to reduce the C-factor to less than 0.10. Noting the restrictions associated with semi-arid conditions where alternative controls may be required
- Construct earth banks on the upslope side to divert water around stockpiles and mulch berms 1 to 2 metres downslope.

Note: it is critical to revegetation success to ensure that the subsoil from the construction of the project is not mixed or blended with the topsoil. Chemical and physical properties are significantly different between these two soil types and will directly affect the success of rehabilitation works on the project.

10.1.1.2 Soil testing

Soil testing across the site should be completed to validate the physical, chemical and nutrient status of the existing soils. The testing regime should be sufficient to assess the soil types on site and the change in the landform. The testing completed should be appropriate to assess cations, pH values, salt content and particle analysis. Testing should be completed with a suitably qualified soil scientist or agronomist to recommend ameliorants to promote plant growth where these are required.

10.1.1.3 Soil preparation

When an area is finished (batter, shoulder or drain) it needs to be given a final trim, confirmed by survey then ripped to provide scarification for the placement of topsoil. Ripping is to be undertaken perpendicular to the direction of water (eg. horizontal for a batter). Ameliorants such as lime, gypsum and fertilizer may be required to support the establishment of the revegetation as recommended by the agronomist. Application of these may include treatments to subsoil and or topsoil.

The timing of rehabilitation is to be within 20 days of final trim. Topsoil should then be spread to a suitable depth depending on the location, design and availability of topsoil. This should provide an adequate depth for the seed to germinate and helps hold water. After the topsoil is applied the area should be furrowed horizontally along the surface contours in preparation for seeding or other application methodologies depending on the erosion risk from these areas.

10.1.1.4 Progressive revegetation

Progressive revegetation will be undertaken for the project which provides significant advantages. These include:

- Increases the ease with which areas can be accessed and prepared
- It stabilises the area as works progress and incrementally reduces the amount of exposed soil that needs to be managed and maintained. The sooner an area can be revegetated to 70% ground cover the sooner it produces ‘clean’ rather than ‘dirty’ water and can be treated accordingly
- Allows for progressive removal of basins where these are installed, allowing these areas to also be rehabilitated
- Stabilises high risk steep slopes consistent with best practice and industry standards to reduce risks on downstream sensitive receivers and controls (refer also to Standard Detail 3 and Appendix A)

- If maintenance does need to be carried out it can be done before access is lost and unnecessary disturbance created
- Increases the likelihood of timing the revegetation of some areas during seasons with favourable conditions for growth. Results will be less 'hit and miss' which reduces the chance of having large sections exposed should a severe weather event occur
- Spreads the cost of revegetating over a greater time.

To address the risk the progressive rehabilitation approach will focus on steeper slopes for progressive rehabilitation in addition to the adoption of this concept across the project site. Where there is opportunity to provide adequate groundcover and reduce erosion this is to be adopted. There may be areas where this is problematic due to the semi-arid conditions the site is exposed to.

10.1.1.5 Establishment

The subsoil and batter preparation process following topsoiling is key prior to seeding and gives the best chance of achieving a good strike of vegetation. The conditions around the project site range significantly in regard to the volume of rainfall. Watering (water cart etc) soon after application in these semi-arid environments may result in initial germination of the seed types and then a period of dry weather until the rainy season. As such rehabilitation watering in these areas following seeding is not intended to be undertaken due to the risk of germination and seed mortality. In preference these areas will be maintained and prepared for wet season weather. Outside of the semi-arid areas of the site the more traditional approach of watering post seeding will be considered.

Once set, the seed will be protected from predation, exposure to the elements and will remain viable for several months favourable for growth.

11. Review and Monitor

11.1 Monitoring, inspection and reporting

Soils and water quality monitoring and reporting of levels of impact will occur for the duration of the Project. Daily visual inspections of the construction site will be undertaken to identify actual or potential soils and water quality concerns. Concerns that cannot be closed-out immediately be raised in an inspection report and issued to the responsible representative for the work area.

Documented weekly environmental inspections will include soils, water quality, spoil and fill management and mitigation measures. This will include inspection of erosion and sediment control measures, water quality sampling and testing and spills.

Where inspections identify a closeout timeframe, these are to be met. Where these are not met they will be escalated to the relevant management team member overseeing the construction for action.

Table 10 Monitoring frequency

Monitoring required	Responsibility	Frequency
Site Inspection	Environmental Representative	Weekly inspection
Post Rainfall inspection	Environmental Representative	Weekly inspection
Pre-wet Season Inspection	Environmental Representative	Pre-wet season

12. References

Best Practice Erosion and Sediment Control Book 1, International Erosion Control Association (IECA, November 2008) (White Book),

Best Practice Erosion and Sediment Control Book 2-Appendices A-G, International Erosion Control Association (IECA, November 2008) (White Book),

Best Practice Erosion and Sediment Control Book 3-Appendicies H-N, International Erosion Control Association (IECA, November 2008) (White Book),

Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition (Landcom 2006) (Blue Book)

Managing Urban Stormwater: Soils and Construction, Volume 2D, Main Road Construction (DECC 2008)

Temporary Stormwater Drainage for Main Road Construction EMS--SP-012 (RMS, 1 June 2011)

Appendix A Erosion and Sediment Control Concept Plans

Note these are concept plans only associated with the project works. Erosion and sediment control plans will be developed for the project specific to the works across the alignment.

1 Typical arrangement Flat areas (to drainage line) lease area

NOTE: Concept ERSED Plans will be reviewed by a CEPESC to confirm treatment prior to implementation.

Upslope Area

Topsoil berm

Diversion berm (Woo Bouy)

Diversion berm (Woo Bouy)

Diversion berm (Woo Bouy)

Mulch/ topsoil diversion bund

Sediment Trap

Sediment Trap

ROW Boundary

Sediment Trap



Mulch bund



Sediment trap off woo-bouy

Adapted from IECA (2015) P28

2 Typical arrangement (Intermediate flows)

NOTE: Creek crossings through all Creeks will be reviewed by a CEPESC to confirm treatment prior to implementation.

Upslope Area

Stabilised batter chute to energy dissipater

Creek line

Stabilised Topsoil berm

Diversion berm (Woo Bouy)

Diversion berm (Woo Bouy)

Diversion berm (Woo Bouy)

Mulch/ topsoil diversion bund

Sediment Traps

Sediment Trap

Waterway Barrier Works Treatment fro waterway



Mulch bund or topsoil quantity

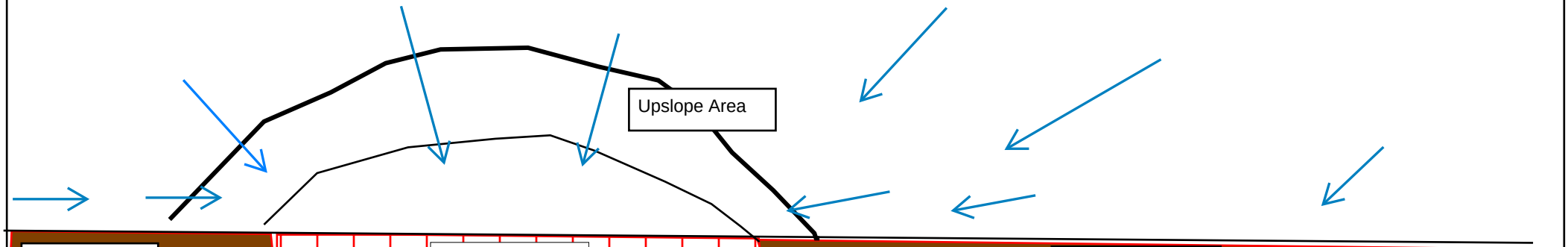


Sediment trap off woo-bouy

Adapted from IECA (2015) P28

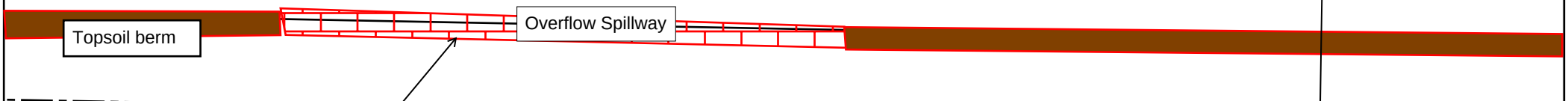
3 Indicative arrangement
(Ephemeral Creek crossing)
Easement

NOTE: Creek crossings through all Creeks will be reviewed by a CEPESC to confirm treatment prior to implementation.



Access track Creek crossing

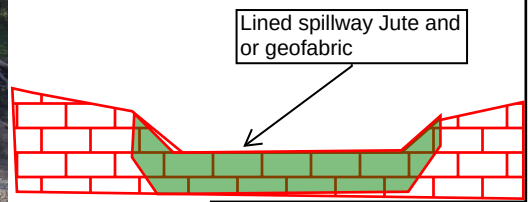
ROW Boundary



Earth bund (lined/ stabilised), with a lined over topping point. Alternatives may be considered including silt curtains depending on crossing location and weather.



Spillway general detail



Adapted from IECA (2015) S1

4 Indicative arrangement (Very steep areas) Access track

NOTE: Concept ERSED Plans will be reviewed by a CEPESC to confirm treatment prior to implementation.

600mm heigh earth compacted diversion berm

rock checks to be treated with Gypsum

rock checks to be treated with Gypsum

Indicative only, further calcs required based on soil types and application

lined overtoping point

Sump sized to IECA

Lined overtopping point

Image 1

Indicative on steep slopes <15%

-Compacted earth berms at 10 metre centres. (note cane reduce distance as slope reduces)

-rock lined drain D 50 running adjacent to slope edge.

-Sump at base to be sized In accordance with White book.

-berms to direct water to sump.

-Berms to be minimum 0.6m in height

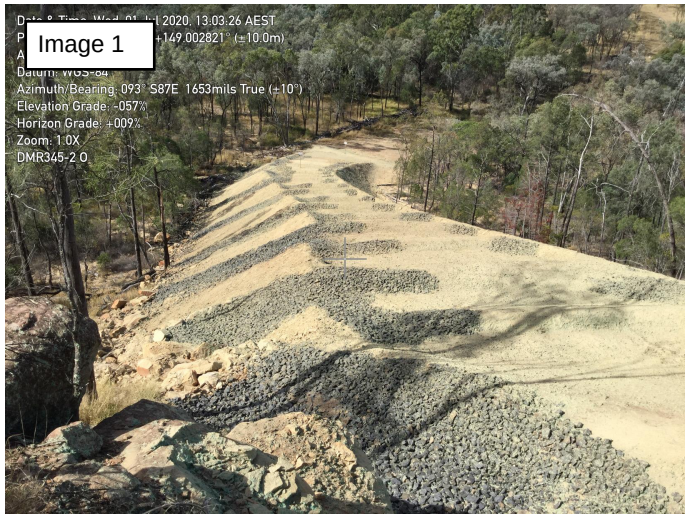




5 Indicative arrangement embankment (very steep areas) ROW

Indicative only, further calcs required based on soil types and application

Diversion berms (Whoa-boy)





Batter Chute with Geofabric or dense grade jute or coir matting with rock treatment over the liner

Image 1

Rock energy disipator d50 to d100

Application of binder to batter and topsoil with seed

Image 2

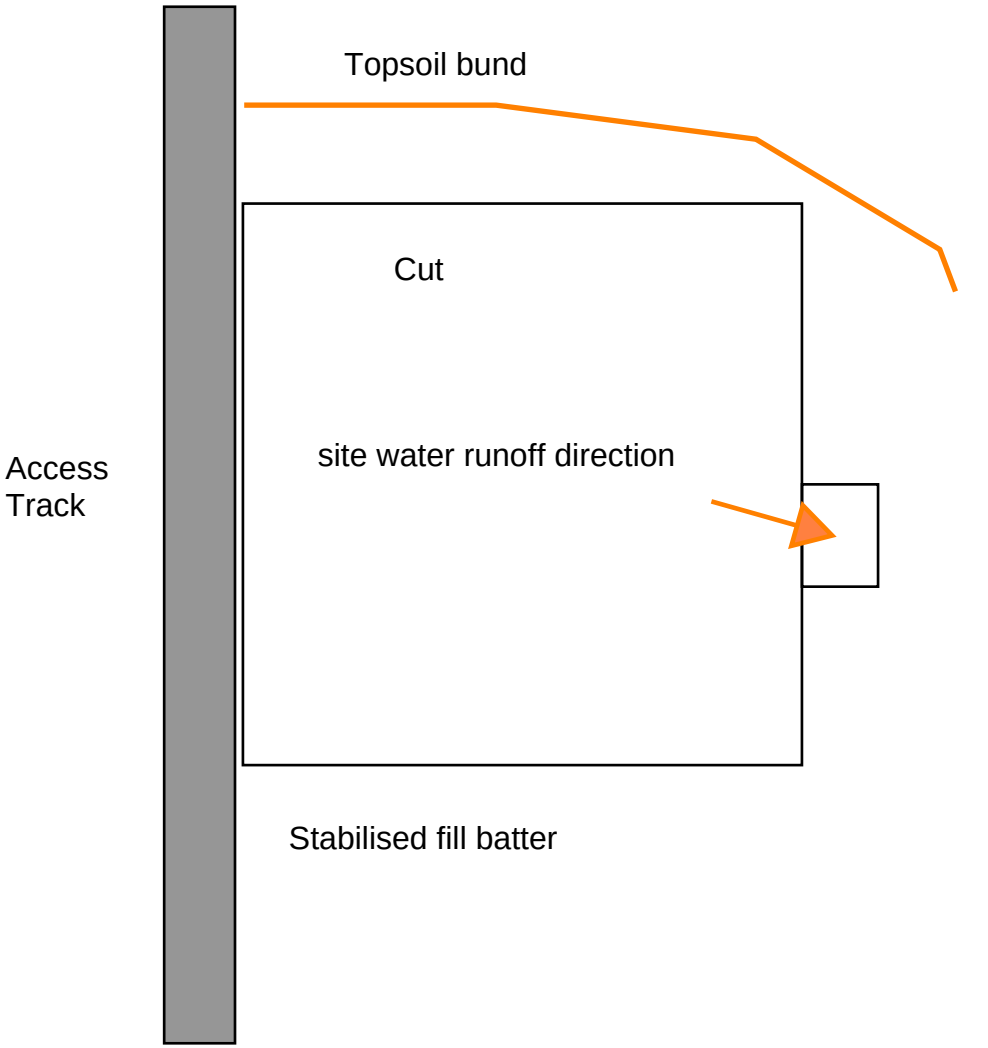
NOTE: Concept ERSED Plans will be reviewed by a CEPESC to confirm treatment prior to implementation.

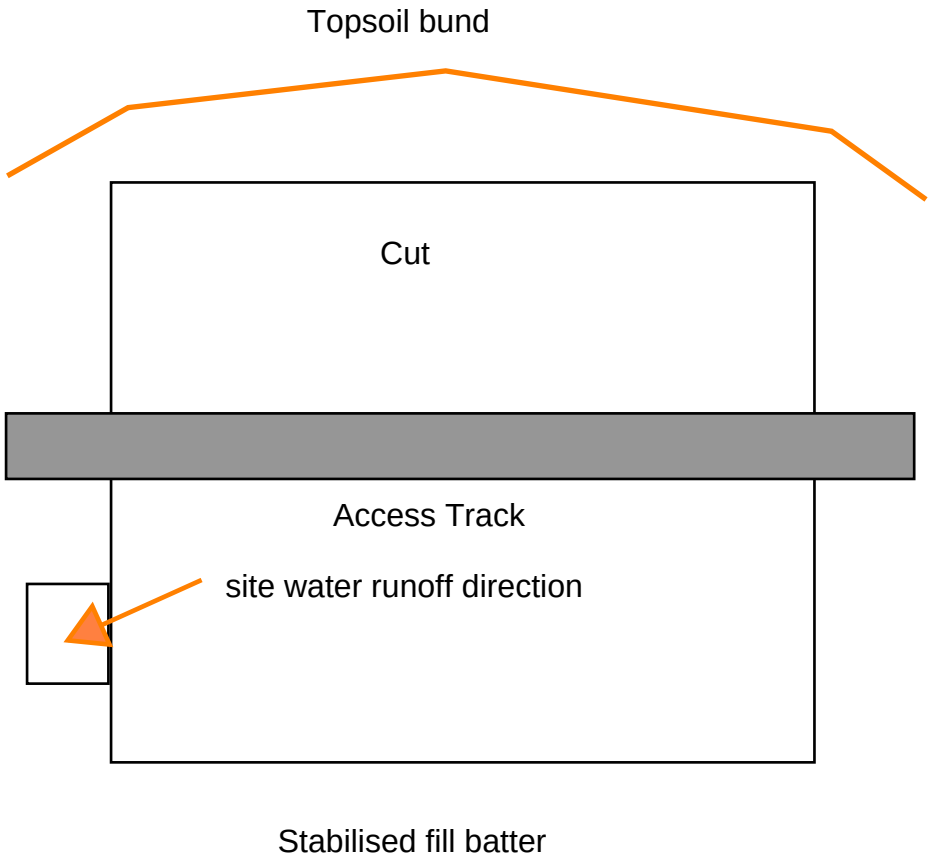
Frequency of diversion berms are dependent on the slope. steeper slopes require more frequent diversions

Indicative only (further assessment require based on soil type and other factors.

Very steep slopes compacted diversion berms at 5 m intervals

Generic Tower Pad Design





Notes:
-Site water to be discharged to the cut/fill interface and to appropriate sump.

-Access track general position above (highside) of site drainage.

-Topsoil should be respread across cut and fill batters prior to drilling footings etc.

Excavated Sediment Trap

Table 1 – Required pond surface area for various treatment standards ($m^2/m^3/s$)

Design standard	Critical sediment size (mm)	Surface area of settling pond per unit discharge for various water temperatures ($m^2/m^3/s$) [1]		
		10° C	15° C	20° C
Type 3 sediment trap	0.50	7.2	6.3	5.5
	0.20	45	40	35
	0.15	80	70	62
Type 2 sediment trap	0.10	180	160	140
	0.05	720	630	550

[1] A 20% increase in the theoretical surface area has been included to account for inflow turbulence.

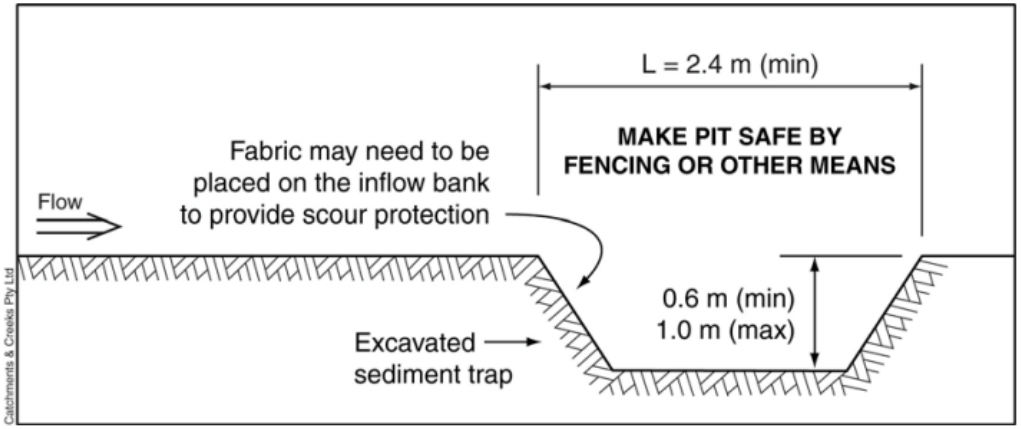


Figure 1 – Minimal dimensional requirements of excavated sediment trap located within a minor drainage path

Construction

1. Refer to approved plans for location and construction details. If there are questions or problems with the location, or method of installation, contact the engineer or responsible on-site officer for assistance.
2. Clear the foundation area of the outlet structure (if any), and install as per separate instructions.
3. Excavate the settling pond in accordance with the approved plans. Unless otherwise specified, the excavated pit should have a side slope of 2:1(H:V) or flatter.
4. Appropriately stabilise any bank subject to direct inflow.
5. Establish all necessary up-slope drainage control measures to ensure that sediment-laden runoff is appropriately directed into the sediment trap.
6. Take all necessary measure to minimise the safety risk caused by the structure.

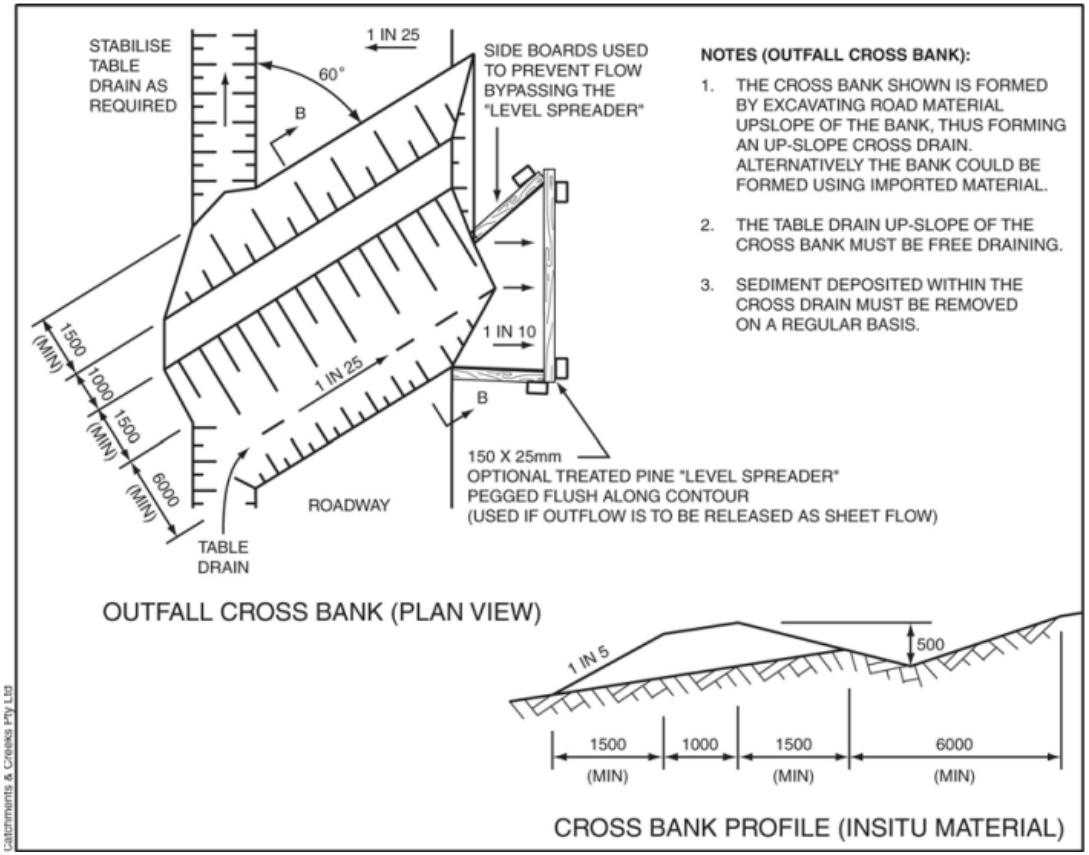
Maintenance

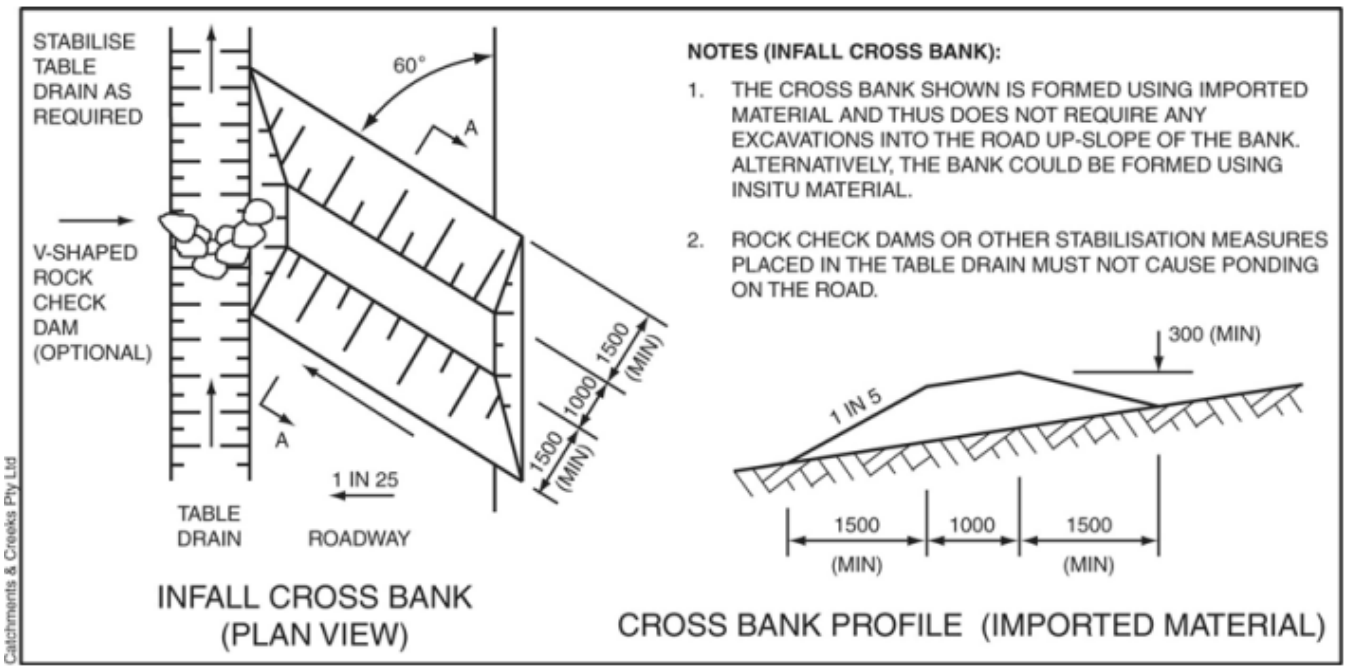
1. Check excavated sediment traps after each runoff event and make repairs immediately.
2. Inspect the banks for slumping or excessive scour.
3. If flow through the structure is reduced to an unacceptable level due to blockage of the outlet structure (if any), then make all necessary repairs and maintenance to restore the desired flow conditions.
4. Check the structure and surrounding channel banks for damage from overtopping flows and make repairs as necessary.
5. Remove sediment and restore original sediment storage volume when collected sediment exceeds 30% of the pit volume.
6. Dispose of sediment and debris in a manner that will not create an erosion or pollution hazard.

Removal

1. When the up-slope drainage area has been stabilised, remove all materials included deposited sediment and dispose of in a suitable manner that will not cause an erosion or pollution hazard.
2. All water and sediment should be removed from the basin prior to the dam's removal. Dispose of sediment and water in a manner that will not create an erosion or pollution hazard.
3. Bring the disturbed area to a proper grade, then smooth, compact and stabilise and/or revegetate as required.

Diversion Berm (Whoa-Boy)



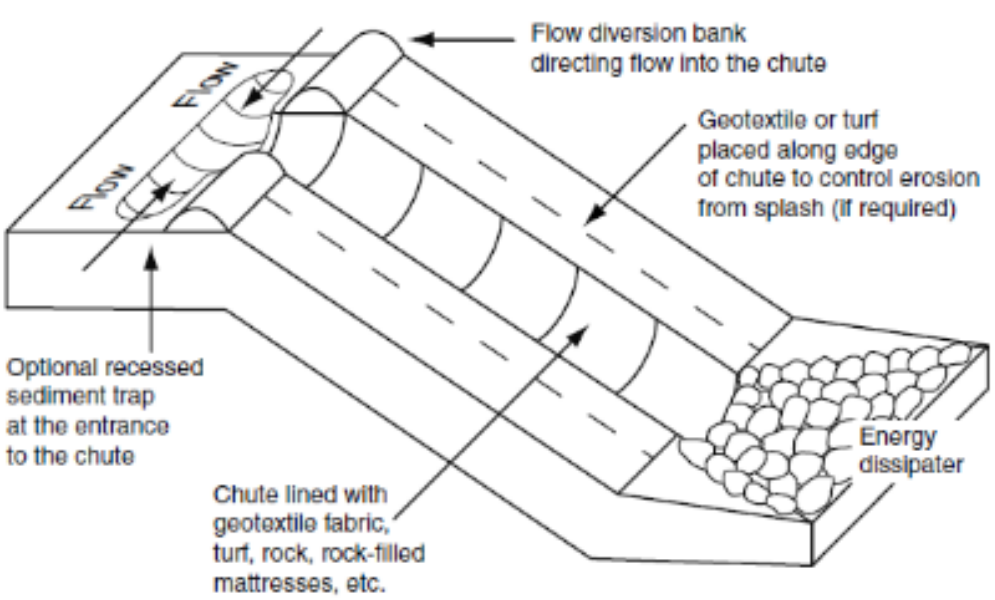


Catchments & Creeks Pty Ltd

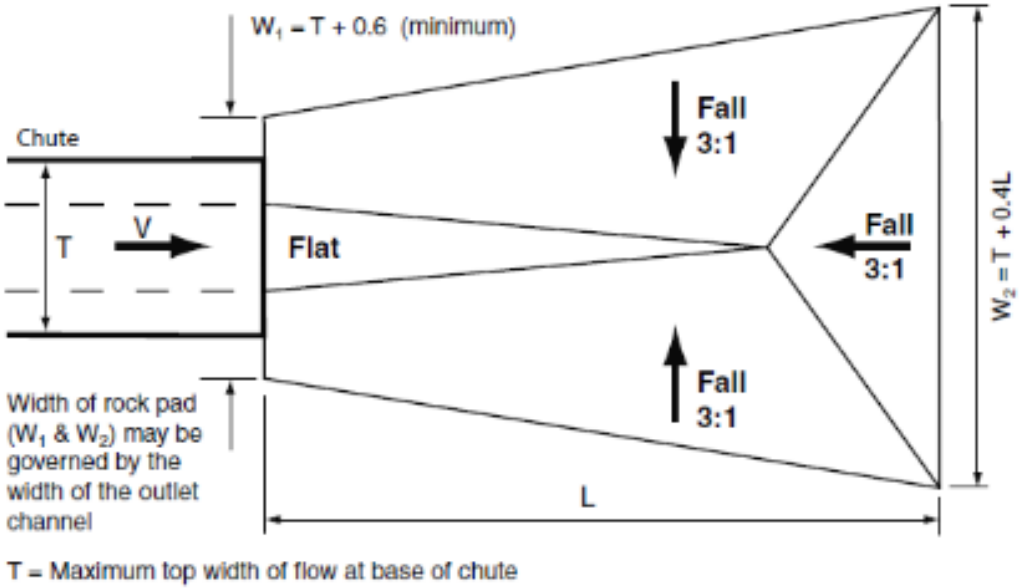
Table 4 – Recommended spacing of diversion drains along table drains [1]

Road grade %	Road grade (degrees)	Spacing (m)
< 2%	< 1.15°	120
2 to 4%	1.15 to 2.3°	60
4 to 8%	2.3 to 4.6°	30
> 8%	> 4.6°	15

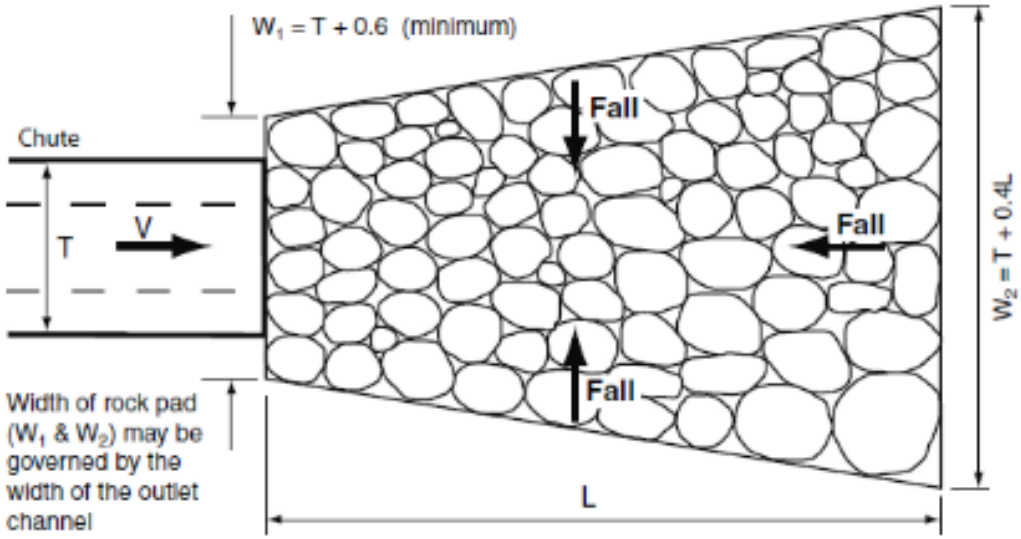
[1] Sourced from Herbert and Evans, 1992



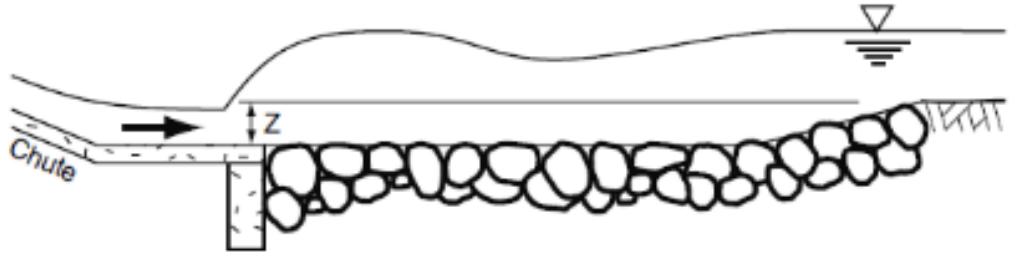
(a) Temporary drainage chute with rock pad outlet structure



(b) Typical layout of an outlet energy dissipater for a drainage chute



(c) Typical layout of a rock pad outlet structure for a drainage chute



(d) Typical profile of a rock pad outlet structure for a drainage chute

Notes:

1. Drawings applicable to temporary drainage chutes, **not** basin spillways.
2. A rock pad outlet structure is just one option for the design of the outlet energy dissipater.

Drawn:	Date:		
GMW	Dec-09	Chutes - General	CH-01

CHUTES - GENERAL SPECIFICATIONS

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. CONSTRUCT THE SUBGRADE TO THE ELEVATIONS SHOWN ON THE PLANS. REMOVE ALL UNSUITABLE MATERIAL AND REPLACE WITH STABLE MATERIAL TO ACHIEVE THE DESIRED FOUNDATIONS.

3. IF THE CHUTE IS TEMPORARY, THEN COMPACT THE SUBGRADE TO A FIRM CONSISTENCY. IF THE CHUTE IS INTENDED TO BE PERMANENT, THEN COMPACT AND FINISH THE SUBGRADE AS SPECIFIED WITHIN THE DESIGN PLANS.

4. IF THE CHUTE IS TO BE LINED WITH ROCK, THEN AVOID COMPACTING THE SUBGRADE TO A CONDITION THAT WOULD PREVENT THE ROCK LINING FROM ADEQUATELY BEDDING INTO THE SUBGRADE.

5. ENSURE THE SUBGRADE IS FIRM ENOUGH TO MINIMISE WATER SEEPAGE.

6. ON FILL SLOPES, ENSURE THAT THE SOIL IS ADEQUATELY COMPACTED FOR A WIDTH OF AT LEAST ONE METRE EACH SIDE OF THE CHUTE TO MINIMISE THE RISK OF SOIL EROSION, OTHERWISE PROTECT THE SOIL WITH SUITABLE SCOUR PROTECTION MEASURES SUCH AS TURF OR EROSION CONTROL MATS.

7. PLACE AND SECURE THE CHUTE LINING AS DIRECTED.

8. IF CONCRETE IS USED AS A LINING, THEN KEEP THE SUBGRADE MOIST AT THE TIME CONCRETE IS PLACED. FORM, CUT-OFF WALLS AND ANCHOR BLOCKS AS DIRECTED IN THE APPROVED PLANS.

9. INSTALL AN APPROPRIATE OUTLET STRUCTURE (ENERGY DISSIPATER) AT THE BASE OF THE CHUTE (REFER TO SEPARATE SPECIFICATIONS).

10. ENSURE WATER LEAVING THE CHUTE AND THE OUTLET STRUCTURE WILL FLOW FREELY WITHOUT CAUSING UNDESIRABLE PONDING OR SCOUR.

11. APPROPRIATELY STABILISE ALL DISTURBED AREAS IMMEDIATELY AFTER CONSTRUCTION.

MAINTENANCE

1. DURING THE CONSTRUCTION PERIOD, INSPECT ALL CHUTES PRIOR TO FORECAST RAINFALL, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER SIGNIFICANT RUNOFF PRODUCING STORM EVENTS, OR OTHERWISE ON A WEEKLY BASIS. MAKE REPAIRS AS NECESSARY.

2. CHECK FOR MOVEMENT OF, OR DAMAGE TO, THE CHUTE LINING, INCLUDING SURFACE CRACKING.

3. CHECK FOR SOIL SCOUR ADJACENT THE CHUTE. INVESTIGATE THE CAUSE OF ANY SCOUR, AND REPAIR AS NECESSARY.

4. WHEN MAKING REPAIRS, ALWAYS RESTORE THE CHUTE TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED LAYOUT IS REQUIRED.

REMOVAL

1. TEMPORARY CHUTES SHOULD BE REMOVED WHEN AN ALTERNATIVE, STABLE, DRAINAGE SYSTEM IS AVAILABLE.

2. REMOVE ALL MATERIALS AND DEPOSITED SEDIMENT, AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. GRADE THE AREA IN PREPARATION FOR STABILISATION, THEN STABILISE THE AREA AS SPECIFIED IN THE APPROVED PLAN.

ADDITIONAL SPECIFICATIONS FOR ROCK PAD OUTLET STRUCTURE AT BASE OF CHUTE:

MATERIALS:

ROCK: HARD, ANGULAR, DURABLE, WEATHER RESISTANT AND EVENLY GRADED WITH 50% BY WEIGHT LARGER THAN THE SPECIFIED NOMINAL ROCK SIZE AND SUFFICIENT SMALL ROCK TO FILL THE VOIDS BETWEEN THE LARGER ROCK. THE DIAMETER OF THE LARGEST ROCK SIZE SHOULD BE NO LARGER THAN 1.5 TIMES THE NOMINAL ROCK SIZE. SPECIFIC GRAVITY TO BE AT LEAST 2.5.

GEOTEXTILE FABRIC: HEAVY-DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH, MINIMUM BIDIM A24 OR EQUIVALENT.

INSTALLATION (ROCK OUTLET PADS)

1. REFER TO APPROVED PLANS FOR LOCATION AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. THE DIMENSIONS OF THE OUTLET STRUCTURE MUST ALIGN WITH THE DOMINANT FLOW DIRECTION.

3. EXCAVATE THE OUTLET PAD FOOTPRINT TO THE SPECIFIED DIMENSION SUCH THE WHEN THE ROCK IS PLACED IN THE EXCAVATED PIT THE TOP OF THE ROCKS WILL BE LEVEL WITH THE SURROUNDING GROUND, UNLESS OTHERWISE DIRECTED.

4. IF THE EXCAVATED SOILS ARE DISPERSIVE, OVER-EXCAVATED THE ROCK PAD BY AT LEAST 300mm AND BACKFILL WITH STABLE, NON-DISPERSIVE MATERIAL.

5. LINE THE EXCAVATED PIT WITH GEOTEXTILE FILTER CLOTH, PREFERABLY USING A SINGLE SHEET. IF JOINTS ARE REQUIRED, OVERLAP THE FABRIC AT LEAST 300mm.

6. ENSURE THE FILTER CLOTH IS PROTECTED FROM PUNCHING OR TEARING DURING INSTALLATION OF THE FABRIC AND THE ROCK. REPAIR ANY DAMAGE BY REMOVING THE ROCK AND PLACING WITH ANOTHER PIECE OF FILTER CLOTH OVER THE DAMAGED AREA OVERLAPPING THE EXISTING FABRIC A MINIMUM OF 300mm.

7. ENSURE THERE ARE AT LEAST TWO LAYERS OF ROCKS. WHERE NECESSARY, REPOSITION THE LARGER ROCKS TO ENSURE TWO LAYERS OF ROCKS ARE ACHIEVED WITHOUT ELEVATING THE UPPER SURFACE ABOVE THE PIPE INVERT.

8. ENSURE THE ROCK IS PLACED IN A MANNER THAT WILL ALLOW WATER TO DISCHARGE FREELY FROM THE PIPE.

9. ENSURE THE UPPER SURFACE OF THE ROCK PAD DOES NOT CAUSE WATER TO BE DEFLECTED AROUND THE EDGE OF THE ROCK PAD.

10. IMMEDIATELY AFTER CONSTRUCTION, APPROPRIATELY STABILISE ALL DISTURBED AREAS.

MAINTENANCE

1. WHILE CONSTRUCTION WORKS CONTINUE ON THE SITE, INSPECT THE OUTLET STRUCTURE PRIOR TO FORECAST RAINFALL, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER SIGNIFICANT RUNOFF PRODUCING RAINFALL, AND ON AT LEAST A WEEKLY BASIS.

2. REPLACE ANY DISPLACED ROCK WITH ROCK OF A SIGNIFICANTLY (MINIMUM 110%) LARGER SIZE THAN THE DISPLACED ROCK.

REMOVAL

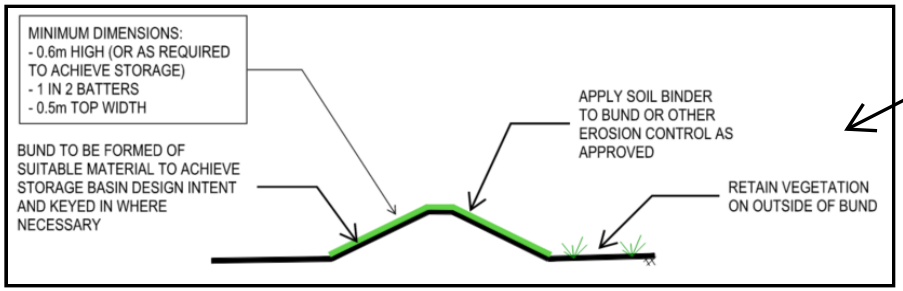
1. TEMPORARY OUTLET STRUCTURES SHOULD BE COMPLETELY REMOVED, OR WHERE APPROPRIATE, REHABILITATED SO AS NOT TO CAUSE ONGOING ENVIRONMENTAL NUISANCE OR HARM.

2. FOLLOWING REMOVAL OF THE DEVICE, THE DISTURBED AREA MUST BE APPROPRIATELY REHABILITATED SO AS NOT TO CAUSE ONGOING ENVIRONMENTAL NUISANCE OR HARM.

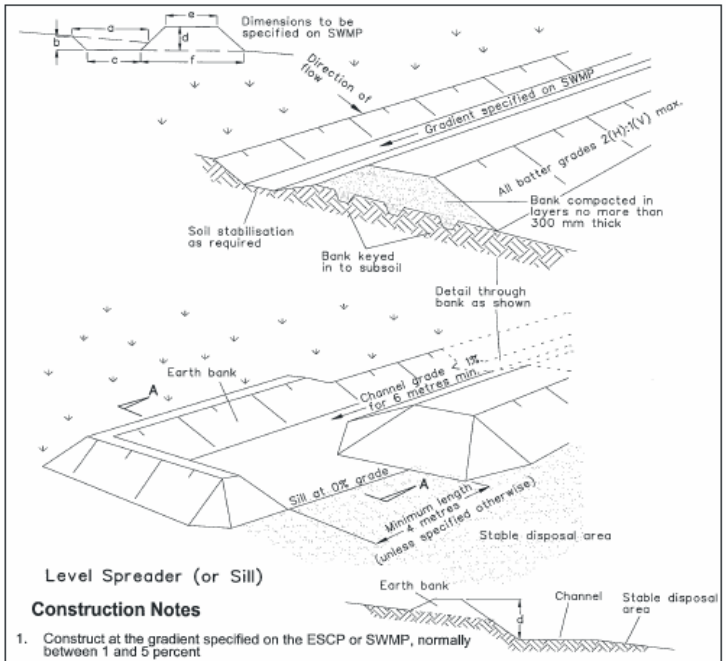
3. REMOVE MATERIALS AND COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

Drawn:	Date:		
GMW	Dec-09	Chutes - General	CH-02

Contour Berm/ High side temporary diversion bund / High flow diversion berm and energy disipator



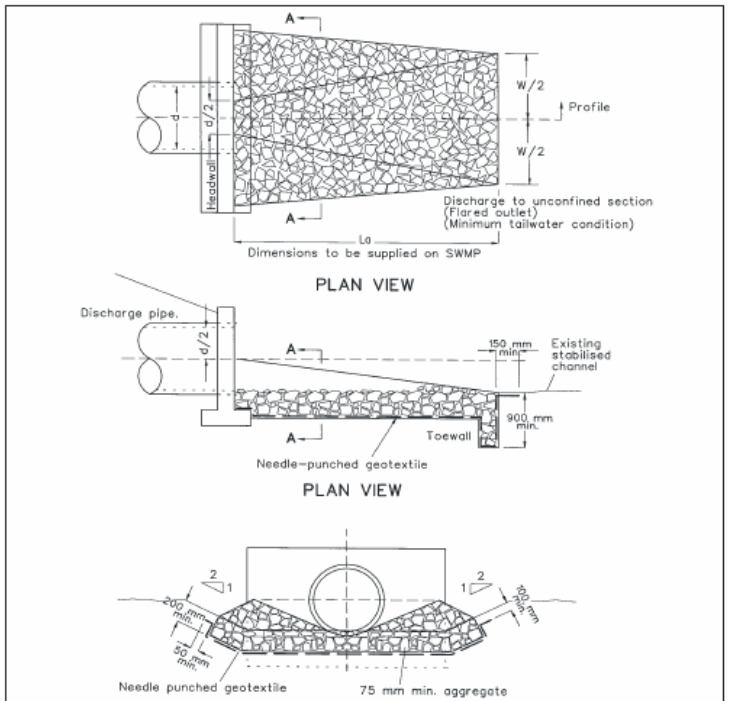
Note: on steeper slopes (>10%) additional stabilsation including jute may be required on the outer clean water diversion bund.



Construction Notes

1. Construct at the gradient specified on the ESCP or SWMP, normally between 1 and 5 percent
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V-shaped, at the dimensions shown on the SWMP.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction following Table 5.2 in Landcom (2004).
7. Where discharging to erodible lands, ensure they outlet through a properly constructed level spreader.
8. Construct the level spreader at the gradient specified on the ESCP or SWMP, normally less than 1 percent or level.
9. Where possible, ensure they discharge waters onto either stabilised or undisturbed disposal sites within the same subcatchment area from which the water originated. Approval might be required to discharge into other subcatchments.

EARTH BANK (HIGH FLOWS) **SD 5-6**



Construction Notes

1. Compact the subgrade fill to the density of the surrounding undisturbed material.
2. Prepare a smooth, even foundation for the structure that will ensure that the needle-punched geotextile does not sustain serious damage when covered with rock.
3. Should any minor damage to the geotextile occur, repair it before spreading any aggregate. For repairs, patch one piece of fabric over the damage, making sure that all joints and patches overlap more than 300 mm.
4. Lay rock following the drawing, according to Table 5.2 of Landcom (2004) and with a minimum diameter of 75 mm.
5. Ensure that any concrete or riprap used for the energy dissipater or the outlet protection conforms to the grading limits specified on the SWMP.

ENERGY DISSIPATER **SD 5-8**

COPPERSTRING 2032

COPPERSTRING 2032 JV

NOISE & VIBRATION MANAGEMENT PLAN

COPPERSTRING 2032

EDMS No : CSPW-EVN-PLN-900-000020
Revision : A02
Date : 06/06/2024

IFR

Approvals and Reviews

Noise and Vibration Management Plan	
Project	CopperString 2032
Client	Powerlink Queensland Pty Ltd
Document Number	CSPW-EVN-PLN-900-000020

Revision History					
Rev No.	Description of Revision	By	Checked	Approved	Date
A01	Developed for PDLA Work Contract	Padmaja Cuppala	David Mclean	Matt Lennon	03/05/2024
A02	Updated in response to comments	Jacinta Fuller	David Mclean	Matt Lennon	05/06/2024

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Appendices

Appendix A Out of Hours Work Permit (Template)
Appendix B Out of Hours Work Protocol

1. Introduction

The purpose of the CopperString 2032 project is to connect the North West Minerals Province (NWMP) of Queensland to the National Electricity Grid. This will not only allow existing loads in the Mt Isa and Cloncurry areas to be fed from the National Electricity Market (NEM), but also provide access to new mining loads and opportunity for connection of renewable generation.

1.1 Project scope

The CopperString 2032 Project is an extra high voltage transmission system intended to connect the North West Power System (NWPS) near Cloncurry and Mount Isa to the Powerlink network and NEM at Mulgrave. Figure 1 provides an overview of the Project.



Figure 1 CopperString 2032 proposed transmission lines and substations

The CopperString 2032 Project will connect the NWMP to the NEM to reduce the cost of power supply and facilitate the large-scale development of the Hughenden wind resource and solar resources within the North Queensland Clean Energy Hub (NQCEH).

The scope of work, traversing east to west, consists of the following sections:

- Mulgrave 500/275kV Substation as the CopperString 500kV connection point to the Queensland SuperGrid and 275kV line augmentation as the CopperString 275kV connection point to the NEM
- Pentland 500kV Substation to support the North Queensland Clean Energy Hub (NQCEH) expansion and as the core for future load connections in the area
- Flinders 500/300kV Substation (Hughenden) as the core for the NQCEH
- Dajarra Road 330/220kV Substation (Cloncurry) as the core for distributions to larger load centres
- The primary CopperString transmission backbone
- Termination via the Mount Isa augmentation 220/132kV.

The scope consists of a transmission line between the above locations carrying extra high voltage power transmission at 500kV, 330kV and 220kV respectively. Substations at the abovementioned interconnecting junctions will distribute power to the NWMP and NQCEH.

1.2 Abbreviations, acronyms & definitions

Table 1 Abbreviations, acronyms & definitions

Term	Definition
CopperString 2.0	CopperString 2032 (the Project)
CEMP	Construction Environmental Management Plan
NVMP	Noise and Vibration Plan
CLMP	Community Liaison Management Plan
UGL CPB JV	UGL/CPB Contractors Joint Venture
EIS	Environmental Impact Statement
EMF	Environmental Management Framework
CoG Report	Coordinator General evaluation report on the environmental impact statement
EP Act	Environmental Protection Act 1994
EPP (Noise)	Environmental Protection (Noise) Policy 2019
PQ	Powerlink Queensland
NWMP	Northwest Minerals Province
NQ	North Queensland
NWPS	Northwest Power System
NEM	National Electricity Market

2. Project Environmental Management Obligations

The Project involves construction and operation of approximately 1,000km of extra high voltage overhead electricity transmission line that will connect the Northwest power system to the state electricity grid. The project includes six (6) new substations, electricity transmission line and transmission towers every 500-600 meters (m). To support construction of the project six construction camps, site offices, laydown/delivery areas, concrete batching plants, and access tracks to the corridor and along its alignment will be provided. The project also provides for improved communications, with the installation of fibre optic cables.

The Coordinator General (CoG) for the Department of State Development, Infrastructure, Local Government and Planning declared the project to be a 'coordinated project' under *the State Development and Public Works Organisation Act 1971* (SDPWO) requiring an Environmental Impact Statement (EIS) for the Project. In September 2022, the Coordinator General provided an evaluation report (CoG Report) on the submitted EIS for the project. This report includes an evaluation of Matters of National Significant (MNES) with recommended conditions for an approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth). In November 2022, a notification of approval was granted from the Department of Climate Change, Energy, the Environment and Water (DCCEEW) (Commonwealth) under the EPBC Act with conditions specific to the Project.

The CoG report also includes recommended conditions for proposed subsequent Ministerial Infrastructure Designations for consideration under the *Planning Act 2016* (Qld) by the Queensland Planning Minister.

The CoG evaluation was based on the draft and revised EISs, submissions made, public consultation on the draft EIS and advice from relevant Australian, State and Local government agencies.

To address and comply its legislative obligations, the UGLCPB JV has prepared a Regulatory Approvals Plan (refer Fig 2) which identifies the environmental approvals applicable to the Project.

The project scope includes (but not limited to):

- Clearing vegetation and earthworks for a transmission line and ancillary infrastructure (e.g. off-easement access tracks and water sources) involving:
  - Disturbance to Matters of National Environmental Significance
  - Disturbance to Matters of State Environmental Significance
  - Interfering with protected species (flora and fauna) and
  - Works within Native Title claimed areas
  - Land affected by Unexploded Ordnance (UXO)
- Constructing and operating accommodation hubs with facilities including:
  - Clearing regulated vegetation
  - Accommodation units and offices, and carparking (involving building and plumbing and drainage works)
  - Mains connection (power, water and sewerage)
  - Mobile and temporary concrete batching plants
  - Motor vehicle workshop
  - Fuel (chemical) storage
  - Water treatment, for provision of drinking water
  - Wastewater (sewage) treatment
  - Biosecurity washdown bays
- Taking water (surface and groundwater)
- Use of quarry material from commercial sources, although project specific borrow pits may be identified as an opportunity
- Crossing mapped waterways and water courses for access
- Upgrading public roads
- Working within and adjacent to rail corridors
- Disposing of contaminated soil (if found within properties listed on the Environmental Management Register (EMR)).

2.1 Relevant legislation and guidelines

2.1.1.1 Legislation

- *Environment Protection and Biodiversity Conservation Act 1999*
- Planning Act 2016
- *Vegetation Management Act 1999*
- *Environmental Protection Act 1994*
- *Fisheries Act 1994*
- *Nature Conservation Act 1992*
- *Electricity Act 1994*
- *Aboriginal Cultural Heritage Act 1993*
- Environmental Protection (Noise) Policy 2019 (EPP (Noise)) (Qld)

2.1.1.2 Guidelines

- Australian Standard AS 1055-2018 Acoustics – Description and Measurement of Environmental Noise
- Noise and vibration from blasting guideline (Department of Environment and Science, 2022)
- NSW EPA Interim Construction Noise Guideline (ICNG)
- Noise Measurement Manual (Department of Environment and Science, 2020)
- Transport Noise Management Code of Practice: Volume 2 – Construction Noise and Vibration (Department of Transport and Main Roads, 2023)

The key piece of legislation which noise is managed under in QLD is the *Environmental Protection (Noise) Policy 2019* which is a subordinate of the *Environmental Protection Act 1994.* The noise policy ensures the following values are protected:

- Ecosystem health and biodiversity.
- Human health and wellbeing for individuals to sleep, study or learn, and recreation including relaxation and conversation.
- Community amenity.

The noise policy also requires noise from any activity to be managed according to the noise management hierarchy:

- Avoid noise impacts.
- minimise noise impacts by orientating the activity away from the receptor/s, or using best available technology.
- Manage noise impacts.

3. Management Plan Interface

This Noise and Vibration Management Plan, hereafter referred to as the NVMP is an overarching Sub Plan of the project's Construction Environmental Management Plan (CEMP) identified in the below Environmental Management Framework (EMF).

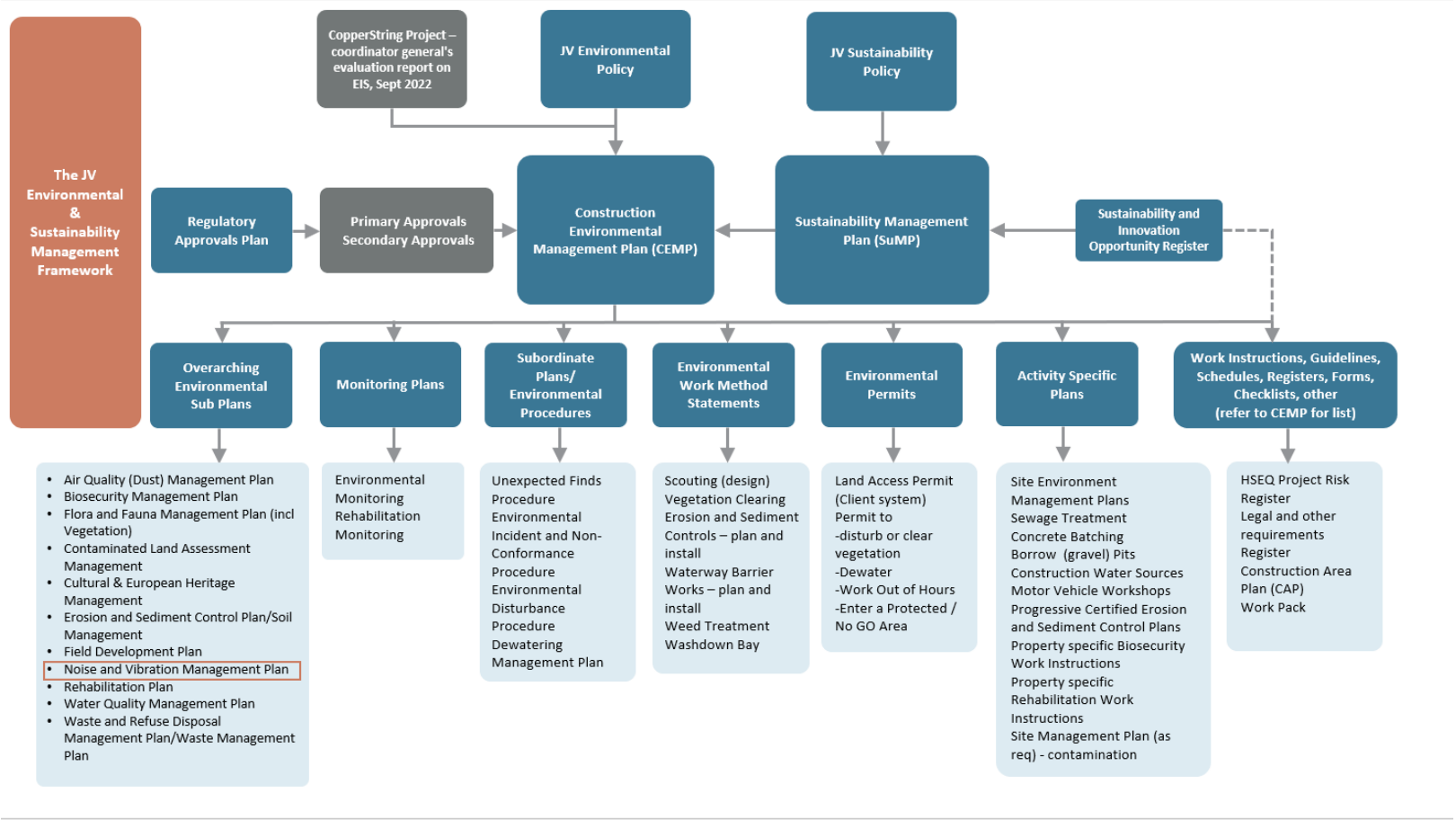

Figure 2: Environmental Management Framework

3.1 Conditions of approval – Requirements and commitments schedule

Table 2 Noise and vibration management requirements

Condition of Approval Reference	Requirement/ Commitment Description	Cross Referenced
CoG evaluation report – Appendix 1 – Imposed conditions, Part A, Communications and stakeholder holder engagement plan Condition 3 (b) (xii)	*PART A 3(b)(xii): processes for providing advanced notice to the stakeholder of construction activities, including: any works which may occur outside of standard working hours; interruptions to utility services; transmission line stringing by helicopter; changed traffic or property access conditions; or periods of high noise, vibration or traffic activities*	Community Liaison Management Plan (CLMP)
CoG evaluation report – Appendix 2 – Part B Recommended conditions for MID. Works adjacent to a railway corridor and railway crossings Condition 14 Railway noise (construction camps)	*PART B 14(a): Prior to the commencement of the action and to be maintained at all times, noise attenuation measures to achieve the following railway noise criteria must be provided:* *(i) for all private and communal open space associated with the workers camps the following external noise criteria must be met:* *< 62 dB(A) Leq (24 hour) free field.* *< 84 dB(A) single event maximum sound pressure level) free field.* *< 65 dB(A) Leq (24 hour) façade corrected; and* *< 84 dB(A) single event maximum sound pressure level) façade corrected.* *(ii) For all residential workforce accommodation not covered by Mandatory Part 4.4 of the Queensland Development Code, the following internal noise criteria must be met:* *< 45 dB(A) single event maximum sound pressure level) for all habitable rooms.*	Applicable to Hughenden Camp. The noise attenuation measures are in the Pitt & Sherry CopperString 2032, Early Works Package, Hughenden Camp Hub Noise Assessment Report, 26 February 2024. Section 8 (Railway Noise)
	PART B14(b): RPEQ certification with supporting documentation must be provided, prior to the commencement of construction and prior to the commencement of use, to the Program Delivery and Operations Unit, North Queensland Region (North.Queensland.IDAS@tmr.qld.gov.au) within DTMR, confirming that the development has been designed and constructed in accordance with part (a) of this condition.	

Condition of Approval Reference	Requirement/ Commitment Description	Cross Referenced
CoG evaluation report – Appendix 2 – Part B Recommended conditions for MID. Construction management Condition 33 (a) (vii)	*PART B33(a): Prior to the commencement of works, prepare and submit a Construction Environmental Management Plan (CEMP) to DSDILGP (infrastructuredesignation@dsdlgip.qld.gov.au). The CEMP must be consistent with management measures detailed in the project EIS and, and must include/address the following:*	CEMP
	PART B33(a)(viii): (vii) hours of construction, vibration, and construction noise (including the default noise standards), in accordance with the Environmental Protection Act 1994 (s440R & 440S)	NVMP (this plan)
CoG evaluation report – Appendix 2 – Part B Recommended conditions for MID Operation management Condition 35(a)(viii)	*PART B35(a): Prior to the commencement of operation, prepare and submit an OEMP to DSDILGP (infrastructuredesignation@dsdilgp.qld.gov.au). The OEMP must be consistent with management measures detailed in the project EIS and should include, at a minimum, the below sub-plans:*	OEMP to be developed by Powerlink Queensland with support from the JV.
	PART B35(viii): Noise and Vibration Management Plan	
CoG evaluation report – Appendix 4 – Proponents commitments Chapter 2 Revised project description (Vol 4 EIS Supplement, Attachment B) Condition C10-C12	*Commitment* *C10: Where work is proposed to be conducted in proximity to a sensitive receptor, the timing of construction will consider the noise, dust, vibration and light impacts of the construction process and of access issues.* *C11: A complaint handling process, including a complaints register, will be developed prior to commencement of construction as part of the Stakeholder and Community Engagement Plan, which will include regular reviews and reporting procedures.* *C12: At laydown/delivery areas along the transmission line, deliveries will occur in a manner not to cause nuisance to a sensitive receptor (occupier of a building) outside of the hours of 6.30 am to 6.30 pm Monday to Saturday (as per the requirements of the Environmental Protection Act 1994).*	Appendix B (this plan) Project Risk register, CEMP and NVMP (this plan)
CoG evaluation report – Appendix 4 – Proponents commitments Chapter 2 Revised project description (Vol 4 EIS Supplement, Attachment B) Condition C19	*C19: In the unlikely event that blasting is required, a licenced contractor will be required to manage all health and safety risks.*	Project Risk register Section 7 (this plan)
CoG evaluation report – Appendix 4 – Proponents commitments	*C92: Traffic Control Plans will be prepared immediately prior to construction by the Construction Contractor which will illustrate the access routes to the site for points along the corridor's election.*	Traffic management Plan

Condition of Approval Reference	Requirement/ Commitment Description	Cross Referenced
Chapter 11 Noise and vibration Condition C92 – C94	*C93: Targeted landholder communication will be conducted prior to especially noisy activities such as blasting activities (if required) and helicopter (aerial) stringing of lines.*	CLMP
	C94: A complaints register will be maintained. Should non-vexatious noise complaints be received, noise monitoring may be undertaken at the locations concerned. Reasonable and feasible measures will be implemented to reduce noise impacts.	Section 5 Complaints Management (This plan) CEMP.
CoG evaluation report – Appendix 4 – Proponents commitments Chapter 19 Environmental Management Condition C153b & C153c	*C153b: As part of the Construction Environmental Management Plan, various sub-plans will be developed and implemented in relation to the environmental aspects for the Project* • *….* • *Noise and Vibration Management Plan* • *…*	CEMP sub section 18.6 NVMP (this plan)
	C153c: As part of the Operational Environmental Management Plan, various sub-plans will be developed and implemented in relation to the environmental aspects for the Project • *…* • *Noise and Vibration Management Plan* • *…*	To be developed as part of OEMP by Powerlink Queensland with support from the JV.
Coordinator Generals Report (Page XIX)	• *To minimise noise and construction impacts the proponent has committed to undertake construction during daylight hours of 6:30am to 6:30pm when in proximity to residences, and to consult with landholders to minimise impacts on livestock (page xix).*	Applicable to project construction.

3.2 Reference documents

This plan forms part of the CEMP which is a living document and will be updated as required where the scope of works is amended or when a subsequent risk has been identified. All changes will be agreed to by the project key stake holders and updated by the environmental team. The following sub plan should be read in conjunction with the following regulatory submissions, granted approvals and project specific documents.

These reference documents act as a guide to develop, implement or adopt further documentation for the project specific noise and vibration management.

Table 3 Noise and vibration management - reference documents

Document Title	Document ID/ Relevant Sections
CopperString 2.0, Supplement to the Draft Environmental Impact Statement, Volume 4, Jan 2022	Section 4.10
CopperString 2.0, Noise and Vibration, Volume 2 Chapter 11	Chapter 11 – Noise and Vibration

Document Title	Document ID/ Relevant Sections
CopperString Project, Coordinator General's evaluation report on the environmental impact statement, September 2022	Other topics – Noise and vibration, subsection 5.8.3 Appendix 1 (Condition 3 (b) (xii)), Appendix 2 Recommended conditions: 14, Condition 33 (a) (vii), Condition 35(a)(viii) and Appendix 4 conditions ref: C10 to 12, C19, C92-94 & C153b & C153c
Framework Environmental Management Plan, Appendix Q EIS	Section 4.7 and Figure 2 (this plan)
CopperString 2032, Powerlink – HSE Specification for Contractors and Suppliers, version B	Section 9
Construction Environmental Management Plan	9310-JV-PLN-CEM-0003
Regulatory Approvals Plan	9310-JV-PLN-RAP-0039
Traffic Management Plan	9310-JV-PLN-TMP-0005
Community Liaison Management Plan	0643-JV-PLN-CLM-0004
CopperString2032 Joint Venture, HSEQ Risk Register	0643-JV-REG-SEQ-0009
Site Environmental Plan template – Tool Site Environmental Plan Procedure	UGLMS 4-2138, Version 2.0 UGLMS- 131-809, Version:1.0
UGL Noise and Vibration Management Procedure	UGLMS-131-401, version 2.0
UGL Hearing and Vibration Protection	UGLMS – 131 – 840, Version 1.0
Environmental Monitoring Instructions	UGLMS -5-1229, Version 2.0
EMS Environmental Requirements	MSID-5-548, Version 1.0
Permit Out of Hours Work (template)	UGLMS – 4 – 2219, Version 3
Pitt & Sherry CopperString 2032, Early Works Package, Hughenden Camp Hub Noise Assessment Report, 26 February 2024 (or as updated)	Report for detailed design

4. Noise and Vibration Management Plan

4.1 Management plan purpose

The Noise and Vibration Management Sub Plan has been developed to meet the requirements under the:

- The Project's Construction Environmental Management Plan (CEMP), section 18.6
- EIS and CoG evaluation report
- Relevant legislative requirements associated during planning & design, pre-construction and during construction activities for the Project
- CopperString 2032, Powerlink – HSE Specification for Contractors and Suppliers, version B.

4.1 Management plan objectives

The noise and vibration objectives are to:

- Effectively manage construction activities to ensure noise and vibration impacts are minimised
- Ensure compliance with relevant Commonwealth, State and Local Government legislation, regulations and approvals
- Identify, monitor, control and limit impacts of noise and vibration from the project
- Zero complaints relating to noise and vibration from project activities
- Ensure project equipment has adequate prevention safeguards and is maintained in good working order.

4.2 Performance/target criteria

- 100% compliance with environmental and safety legislative requirements for noise and vibration
- No community complaints relating to noise and vibration arising from project construction activities.

5. Noise and Vibration Background

The overall level of sound is generally expressed in terms of decibels (dBA), which is measured with a sound level meter with an “A weighting” filter. The filter has a frequency response similar to that of human hearing. The terms noise and sound will be used interchangeably within this plan. The following describes typical noise sources and their noise levels.

Table 4 Typical noise sources and levels

Typical Noise Level (dBA)	Typical Source	Subjective Loudness
130 120 110	• Threshold of pain • Heavy rock concert • Grinding on Steel	Intolerable Extremely noisy
100 90	• Loud car horn at 3M • Construction site with pneumatic hammering	Very noisy
80 70	• Kerb side of busy road • Loud radio or television	Loud
60 50	• Bird calls • Insects on a warm evening	Moderate to quiet
40 30	• Rural property during day with light wind	Quiet to very quiet
20	• Very rural location on winter’s night	Almost silent

5.1 Factors affecting noise levels

Noise travels from a source to a receptor, via a pathway. The following factors contribute to the level of noise heard at a receiving receptor:

- Distance

- Weather conditions
- Source sound power levels
- Terrain
- Receptor design.

Changes in all these factors will be considered when managing noise and vibration on the CopperString 2032 project. Further detail for each factor is outlined below:

5.1.1 Distance

Apart from the source of the noise, distance is one of the most prominent factors in determining the noise level that reaches a receptor. As noise travels from the source, it typically loses energy and therefore the greater the distance between the source and the receptor, the lower the noise levels are likely to be at the receptor. Higher frequency noises will lose energy faster than low frequency noises therefore the effect distance has on noise is less on lower frequency sounds then high frequency.

5.1.2 Weather conditions

The time of the day and weather conditions when noise is been generated will impact the noise levels that are heard at receivers. The following will impact noise propagation:

- Wind speed
- Wind direction
- Temperature
- Humidity
- Seasons
- Time of the day.

Temperature inversions increase noise propagation, these inversions are more common at dawn, dusk and night periods particularly during cooler weather. Noise will therefore generally travel further and reach receptors at higher energy levels during these periods as opposed to warmer conditions and during daylight hours where noise will generally reach receivers at lower levels.

5.1.3 Source sound power levels

Sound power level is the volume and frequency of noise emitted from a noise source. The sound power level of a noise source can impact the noise received at a receptor. Higher volumes and lower frequency generally result in louder noises at the receiving receptor then lower volumes with higher frequency.

5.1.4 Terrain

Different landscape features such as ground elevation, vegetation type and thickness and man-made landscapes all factor in the noise levels at receiving receptors. Higher terrain and heavily vegetated areas absorb sound reducing the noise level between a source and receptor. Generally flat areas with no or minimal vegetation or landscape features will lead to sound travelling further between the source and receptors. This is site specific and may change dependent on the surface type (i.e. hard pavements will allow for sound propagation).

5.1.5 Receptor design

A key factor in noise levels that are heard at a receptor is the receptor design. The noise that is heard in a receptor is dependent on the amount of sound that can get through a dwelling which is impacted by building materials, window types and glazing quality. If windows are open, closed or partly closed, noise heard at a receptor can vary as much as 10 dB(A).

6. Existing Environment

The project area consists predominantly of rural environment used for cattle breeding, grazing and general agricultural purposes. Sensitive receptors are generally sparse consisting predominantly of farming residences . Non-residential accommodation facilities and laydown compounds will also be located within the vicinity of townships and more frequent sensitive receptors. The continued amenity of the project footprint relies on adequate management of project related noise and vibration.

Generally, the following environmental values have been considered when assessing noise and vibration impacts from the CopperString 2032 project:

- Health and wellbeing (including ability to converse and sleep)
- Community amenity
- Historic heritage building and structures
- Livestock
- Native fauna.

6.1 Existing background noise sources

Background noise was studied and recorded along the project corridor for the CopperString EIS and is summarised below.

Table 5 Background noise study - project corridor

Location	Description of Observation
Mount Isa (Mica Creek Road)	• Steady state noise emissions from the Mica Creek Power Station during all periods of day and night. While the PowerStation has been decommissioned, noise levels are likely to remain through two new gas fired power stations. • Background noise from sources including a concrete batch plant and other industrial sources also audible.
Mount Isa (3.5KM north of proposed substation)	• Industrial noises clearly discernible within ambient noise data. • During day periods, noise from birds, wind, traffic and insects masked industrial noise sources. • During night-time periods, industrial hum and insect were the dominant noise measured.
Cloncurry (Roxmere Road)	• Background and ambient noise levels dominated by insects and birds. Mining activity identified 2KM away however topography shielding is the likely reason why industrial noise is barely audible.
Richmond (Windsor Road)	• Little to no traffic noise, no industrial noise.
Hughenden (Beaconsfield Road)	• Background train loading and unloading noise audible, background insect noise during the evening.
Charters Towers (Mountain View Road)	• No industrial noises audible, background noise dominated by natural sound and light wind.
Barkly Highway (60KM east of Mt Isa	• Vehicle pass-by's observed during day and night, very loud due to the large number of B doubles and rough road surface. Between vehicle pass-by's noise is dominated by natural background noise.

6.2 Hours of operation

To minimise noise and construction impacts, the JV will generally undertake construction during daylight hours of 6:30 am to 6:30pm when in proximity to residences and will consult with relevant landowners to minimise impacts of livestock. An Out of hours protocol has been developed for the project where works are required outside of standard daytime construction hours, where technically justified or inaudible.

6.3 Sensitive receptors

Potentially affected sensitive receptors include residential premises and building points which are in the vicinity of the corridor selection. For the study of the noise and vibration impact assessment, residences within two (2) kilometres of the centre line of the proposed corridor selection or substation site are considered. The review identified 55 sensitive receptors for the purposes of noise and vibration assessment.

A review of potentially affected sensitive receptors along the corridor selection indicates that the 46 of the 55 (including 2 non-residential receptors) identified receptors are greater than 750m from the proposed transmission line. The type of receptor, approximate distance and coordinates are provided in table 6 below.

The primary risk of noise impacts is associated during construction of transmission lines and associated infrastructure. The sensitive receptors in proximity to the project corridor have the potential to be impacted by construction traffic impacts (truck movements), helicopter noise from stringing of powerlines and general construction noise. Table 8 outlines the control measures that will be implemented to manage the noise and vibration impacts.

The exceptions to this include sensitive receptors number 45-55, which are existing workers accommodation located between approximately 150m and 350m of the existing Mount Isa power stations and electrical substations. These sensitive receivers will be specifically managed through consultation and mitigation to address issues associated with noise.

Table 6 Sensitive receptors - noise and vibration

Residential (Unless otherwise noted) Receptor number	Approximate distance from corridor (m)	Coordinates (GDA04) (m)	
		Easting	Northing
1	1,866	478,715	7,791,461
2	782	470,070	7,787,999
3	1,739	465,442	7,781,419
4	962	422,731	7,759,354
5	1,743	421,973	7,759,802
6	1,848	354,040	7,720,974
7	1,958	205,273	7,686,069
8	1,549	196,358	7,684,976
9	1,177	768,786	7,686,785
10	1,799	739,942	7,691,521
11	1,695	716,251	7,693,234
12	1,815	700,852	7,691,947
13	1,894	654,981	7,700,778
14	1,893	629,778	7,698,952
15	1,910	613,729	7,697,966
16	1,903	613,659	7,697,973
17	1,876	453,691	7,704,669
18	1,827	448,434	7,707,124
19	1,020	448,214	7,706,232
20	1,732	447,910	7,706,889
21	1,995	343,827	7,702,956
22	882	343,674	7,701,816
23	1,898	343,770	7,702,941
24	1,617	343,671	7,699,317
25	1,585	343,652	7,699,349
26	1,602	343,642	7,699,332

Residential (Unless otherwise noted) Receptor number	Approximate distance from corridor (m)	Coordinates (GDA04) (m)	
		Easting	Northing
27	1,590	343,618	7,699,344
28	1,667	343,617	7,699,266
29	1,431	343,559	7,702,420
30	1,357	343,550	7,702,320
31	1,933	343,530	7,703,081
32	1,833	343,524	7,702,968
33	1,431	343,497	7,702,481
34	1,723	343,459	7,702,879
35	1,475	343,457	7,702,573
36	1,370	343,455	7,702,437
37	1,578	343,397	7,702,746
38	1,790	343,360	7,703,014
39	747	343,079	7,701,931
40	914	343,051	7,702,178
41	783	343,051	7,702,011
42	1,151	343,043	7,702,459
43	990	343,028	7,702,282
44	1,315	342,994	7,702,659
45	309	342,944	7,701,240
46	311	342,920	7,701,241
47	318	342,891	7,701,248
48	296	342,866	7,701,243
49	271	342,839	7,701,244
50	250	342,815	7,701,245
51	222	342,787	7,701,245
53	199	342,763	7,701,244
54	174	342,737	7,701,246
55	145	342,707	7, 701,249
56	1,878	341,786	7,703,158

Note: Receptors 1-9 in MGA94 Zone 55, remainder in MGA94 Zone 54

7. Potential Construction Noise

Construction noise will be generated from a range of sources throughout the project at different sound levels. The following highlights the activities and noise levels which are expected to be generated by machines/equipment used.

Table 7 Typical noise levels from construction activities

Activity	Source of noise	Noise rating 7m from Target Source* sound pressure level dB(A)	
		Leq (15 min)	Lmax
Early works and site setup	• Forklift/telehandler	81	
	• Handheld tools (electric)	77	
	• Handheld tools (pneumatic)	91	
	• Light vehicle	80	
Construction Camp	• Dozer (large)	92	95

Activity	Source of noise	Noise rating 7m from Target Source* sound pressure level dB(A)	
		Leq (15 min)	Lmax
Clearing and access	• excavators (45t)	83	90
	• Dump Truck (50t) Unloaded	83	90
	• Front end Loader	88	90
	• Water Cart	82	
	• Grader	85	90
	• Roller	82	88
	• Chainsaw (4-5hp)	89	92
	• Jackhammer	96	
	• Rock breaker	93	
Foundations and tower erection	• Drill rigs	91	113
	• Mobile batching plant	83**	
	• 120 Tonne crane	88	90
	• Concrete pump	77	
	• Road truck	83	88
Stringing	• Helicopter	87 (500 feet)	
	• Winch		
	• Tractor	100	

* Source: Guideline for the Management of Noise and Vibration: Construction and maintenance Activities, EHTM Attachment 7D, Dept for Infrastructure and Transport, Government of South Australia.

**US Dept of Transportation, Construction Noise Handbook. (table 9.1)

8. Out of Hours Noise

Out of hours noise will be generated for key activities associated with the project. This will potentially include the following construction related works that are technically justified:

- Operation of generators at camps where mains power is insufficient for camp operation
- Operation of concrete batching plants where technical specifications require adequate management of concrete mix designs for construction. Significant temperatures can directly affect batch plant operation and operations undertaken outside of hours may be required.
- Operation of pumps for the purpose of water extraction where limited water supplies exist. Specifically, where flow rates are less than 14 l/sec and a turkeys nest or equivalent is required for sufficient construction water for the project works
- Operation of equipment that is inaudible at a sensitive receiver.

Works along the easement corridor have been identified as likely to have minimal impact to sensitive receivers due to the significant separation distance to sensitive receivers. An out of hours permit is provided in **Appendix A.**

The Out of Hours Works protocol has been included in **Appendix B.** This Out of Hours Works protocol is dependent on the approval conditions associated with the MID approvals and will be developed in consultation with PQ for finalisation.

9. Noise and Vibration Management

The below table outlines the control measures for the project's Noise and Vibration management approach during planning and design, pre-construction and during construction activities.

Table 8 Noise and vibration control measures

Item	Aspect	Control measures	Area of Concern	Timing	Performance Criteria
1	Training and competency	All personal will undertake the site environmental induction which will include detailed project noise and vibration information.	Entire project	Prior to mobilisation	100% of site personnel deemed competent in noise and vibration management.
		Targeted noise and vibration toolboxes, training, education campaigns and notices will be developed and implemented. This includes high risk noise and vibration task awareness campaigns.	Entire project	Throughout project focussing on high-risk periods.	Targeted noise and vibration campaigns will be run once every six months.
		All personnel that are required to undertake noise and vibration monitoring will be trained in the use of the noise and vibration equipment.	Monitoring	Throughout project	All persons undertaking monitoring will be suitably trained in the use of noise and vibration equipment.
2	Planning and design	Quieter / less vibration emitting construction methods will be assessed throughout the design process and implemented where feasible and reasonable.	Entire construction area	Design	Quieter / less vibration emitting construction methods are considered during the development of each construction method
		Siting and operation of construction camps must consider noise from the following sources in the planning and development of the facilities for sleeping and amenity: • Road traffic • Rail. The siting and operation of accommodation facilities must consider social impacts by predicting noise impacts and identifying measures in design for siting of and operating high noise and vibration impacting activities such as: • Concrete batching plants • Motor vehicle workshops • Sewage and water treatment plants • Washdown bay operations • Out of hours deliveries • Use of heavy plant and equipment in laydown areas.	Accommodation facilities	Design and siting	Noise sources are considered when determining location of each accommodation facilities.

		Site environment plans including land access management plans will be developed with the following information:
		• Every access point from a public road to the easement
		• Every access point from private roads or and other area to the easement
		• Details of speed limits on roads, access tracks and the easement.
		• Any restrictions on access points and access to site locations including;
		  ○ Restricted days and or restricted access at specified times on specified days.
		  ○ Restrictions in what vehicles and plant can access the easement.
		• Restriction on what works can be performed.
			Access points to the easement and construction site locations	Days and times specified	Site environment plans include noise and vibration mitigation measures relevant to the activity.

		The corridor location has been selected to ensure that, with the exception of houses associated with the Mica Creek Power station, a 750M buffer exists between the transmission line and nearest sensitive receptors.	Transmission line corridor	Throughout project	Corridor design reflects a 750m buffer between the transmission line and sensitive receptors with the exception of houses associated with the Mica Creek Power station.
		Consultation with local residences, land holders and building owners will begin during the planning phase and continue throughout construction to address noise and vibration concerns.	Entire project	During planning and construction	Local residents, land holders and building owners are consulted in accordance with the Community Liaison Plan.

Item	Aspect	Control measures	Area of Concern	Timing	Performance Criteria
		Transport routes will avoid sensitive areas where feasible and reasonable, in accordance with the Road Use Management Plan agreements with Council/DTMR.	Transport routes	Design and planning	Transport routes for the project will avoid sensitive areas where feasible and reasonable.
3	Construction	Where feasible and reasonable, construction works will only be undertaken during standard daytime construction hours of 6:30am to 6:30pm Monday to Saturday where near residential receptors. Works outside these hours are only permitted after consultation with the affected receptors and community regarding the scope of works and proposed mitigation.	Entire project	Throughout project	Works to be undertaken within standard daytime construction hours when in the vicinity of sensitive receptors or in accordance with the requirements of the Out of Hours Works protocol.
		Where works are required to be undertaken outside of standard daytime construction hours, an Out of Hours Works Permit must be obtained prior to commencing work outside of allowable hours.	Entire project	Works outside of standard construction hours	No works conducted outside of hours without an Out of hours work permit.
		All vehicle, plant and equipment will undergo regular maintenance and, where feasible, be fitted with noise suppression devices	Vehicles, plant and equipment	Throughout project	All plant to be maintained in accordance with manufacturers requirements and fitted with noise suppression, where feasible.
		Heavy and noisy vehicles will be restricted from using access points near sensitive receptors to within standard daytime construction hours.	Vehicles, plant and equipment	Throughout project	No use of access points near receptors by heavy and noisy vehicles outside standard daytime construction hours.
		If an exceedance of the external construction noise criteria for accommodation cannot be avoided outside standard daytime construction hours, options to apply time restrictions and quiet periods for nearby receptors will be implemented where feasible and reasonable. Landowners and nearby receptors will be notified prior to the commencement of these noisy works.	Entire project	Throughout noisy periods.	Quiet periods or time restrictions implemented where an exceedance of the external construction noise criteria for accommodation cannot be avoided outside standard daytime construction hours.
		Sufficient warning will be provided to potentially affected receptors prior to expected especially noisy works (helicopter works and blasting)	Entire project	Throughout noisy periods.	Notification provided to nearby receptors prior to the commencement of especially noisy works (helicopter or blasting work).
		Construction machinery, plant and equipment will be switched off or throttled down to a minimum when not in use.	Entire project	Throughout construction periods	Machines, plant and equipment noise switched off or throttled down to a minimum when not in use.
		Deliveries shall be arranged such that transport vehicles do not park up in local streets and occur within standard daytime construction hours, or in accordance with the Out of Hours Works Protocol.	Delivery locations	Throughout project	Deliveries do not park in local streets outside standard daytime construction hours. Deliveries outside standard daytime construction hours occur in accordance with the Out of Hours Works Protocol
		Concrete batch plants will be setback or screened from sensitive receptors, in accordance with relevant approvals. Where batching plants are co-located with accommodation facilities they will be setback or have acoustic shielding ensure noise levels within habitable rooms comply with the external construction noise criteria for accommodation.	Batching plants	Throughout construction periods	Batching plants setback or screened from sensitive receptors to comply with the external construction noise criteria for accommodation. Batching plants will have acoustic shielding to comply with the external construction noise criteria for accommodation.
		Where laydowns, material stockpiles and workshops are co-located with accommodation facilities, they will be setback from accommodation and recreation buildings to ensure noise levels within habitable rooms comply with the external construction noise criteria for accommodation.	Accommodation facilities	Throughout construction periods	Laydowns, material stockpiles and workshops setback from accommodation buildings where co located.
		A complaints register will be developed and maintained. The register will capture details of any noise and vibration complaints and follow up actions/ rectification measures.	Entire project	When complaints are received.	Complaints register developed and maintained
		Noise and /or vibration monitoring will be undertaken on a risk basis to quantify noise/vibration levels at the commencement of an activity in a high-risk location, where noise levels are likely to exceed the external construction noise criteria for accommodation at sensitive receptors. Monitoring will also	Entire project	Throughout construction periods	Noise and / or vibration monitoring will be undertaken at the commencement of activities which are likely to exceed the external construction noise criteria for accommodation at

Item	Aspect	Control measures	Area of Concern	Timing	Performance Criteria
		be undertaken as required by Out of Hours Works Permits and in response to non-vexatious complaints. The Noise Monitoring Program will be designed by a Suitably Qualified Person in accordance with the *Transport Noise Management Code of Practice: Volume 2 – Construction Noise and Vibration* (Department of Transport and Main Roads, 2023), and include: • Baseline noise conditions • Noise limits required by the legal framework • Noise sampling techniques and equipment • Sampling locations • Sampling method (including remote data access) • Data analysis and reporting requirements. A copy of the noise monitoring report will be issued to Powerlink Queensland. If infrastructure/humans are at risk of vibration, a Vibration Monitoring Program will be designed by a Suitably Qualified Person with experience in vibration monitoring, and include: • Evaluation of sensitive receptors and vibration tolerance (to avoid damage/nuisance) • Completion of pre- and post-construction condition surveys (by Powerlink Queensland) • Vibration monitoring locations • Monitoring equipment/sampling technique (including remote data access) • Notification triggers • Data analysis and reporting requirements. A copy of the vibration monitoring report will be issued to Powerlink Queensland.			sensitive receptors and as required by Out of Hours Works Permits.
4	Blasting	All blasting will be carried out in accordance with AS 2187 standards and applicable legislation in Section 2.1.1.1.	Areas where blasting is required	During blasting	Zero breaches of legislation or standard during blasting.
	Blasting	Initial blasting will be monitored to develop future blast specific designs, optimise further blasts and validate blasting predictions against actual event blasting.	Areas where blasting is required	During blasting	All blasting monitored to optimise future blast design.

10. Complaints Management

Complaints are to be handled in accordance with the Community Liaison Management Plan. Where there has been receipt of a complaint relating to noise and vibration nuisance, the following applies:

- Environment Team will need to be notified
- Environment team must notify PQ, as soon as practical but within 12 hours (verbally or in writing) of complaint
- Environment team will record the complaint in Synergy as an environmental complaint
- Environment team will review the complaint within 24 hours and respond to the stakeholder team and Powerlink Queensland with proposed investigation/response
- Environment team must provide an investigation report covering all aspects of HSE in relation to the complaint/event, with inputs from others within the team as required
- Environmental Team is to provide weekly progress reports to the stakeholder team until the complaint can be closed. Timeframes may vary depending on the extent and severity of the complaint; however, updates are recommended every three days
- Once the situation is resolved, this will be updated and closed out on Synergy as an environmental incident.

Environmental Investigation methods for complaints relating to noise and vibration will include at a minimum:

- Consultation with the Construction contractor and Project Manager
- A review of current activities and other potential Noise emission sources in consultation with site supervisors
- Carry out investigation into the cause of the excessive noise event including reference to site logbook. and vehicle logbook
- Assess the meteorological conditions (wind speed, wind direction etc)
- Where necessary, contact the complainant to discuss cause of event and implement noise controls as required
- An inspection of the site to confirm minimum/site specific mitigation measures are compliant in addition to a review of previous inspections (weekly and/or daily)
- An detailed investigation report must be prepared and provided to PQ as per the HSE Specification for Contractors and Suppliers
- The investigation report must be a systematic and comprehensive HSE investigation (such as ICAM or to a similar level) which identifies system or control deficiencies and recommends actions to prevent reoccurrence. Investigations will include the following as a minimum:
    i. Contractor details (name/s, address, contact information, Contract number)
    ii. location, time and date of the incident or event
    iii. detailed description & sequence of the incident or event (including activities leading up to the occurrence)
    iv. details of who was notified and the immediate actions taken
    v. Any identified contributing factors categorised according to:
        - Absent or Failed Defences
        - Individual/Team Actions
        - Task/Environmental Conditions
        - Organisational Factors.

Environmental compliance investigation results will be recorded in Synergy, whilst a complaint may not necessarily be an environmental incident, the definition will be based on project definitions.

Following the completion of an incident investigation unless otherwise requested by PQ a document must be submitted to PQ to publicly share appropriate relevant information and learnings. The focus of this 'Lessons Learnt' would be to outline the basic nature of the incident and any actions that may help others to respond accordingly to reduce or eliminate the potential for future similar occurrences and/or injuries. This may consider but not be limited to the distribution of an initial HSE Alert and subsequent post incident lessons learnt briefings and bulletins.

Copies of the internal report will be available to specific personnel upon request, and, when complete, will be provided as part of the subsequent Monthly Environmental Report.

All external communication regarding the complaint will be managed by the community team, unless otherwise requested by the Community and Stakeholder Manager.

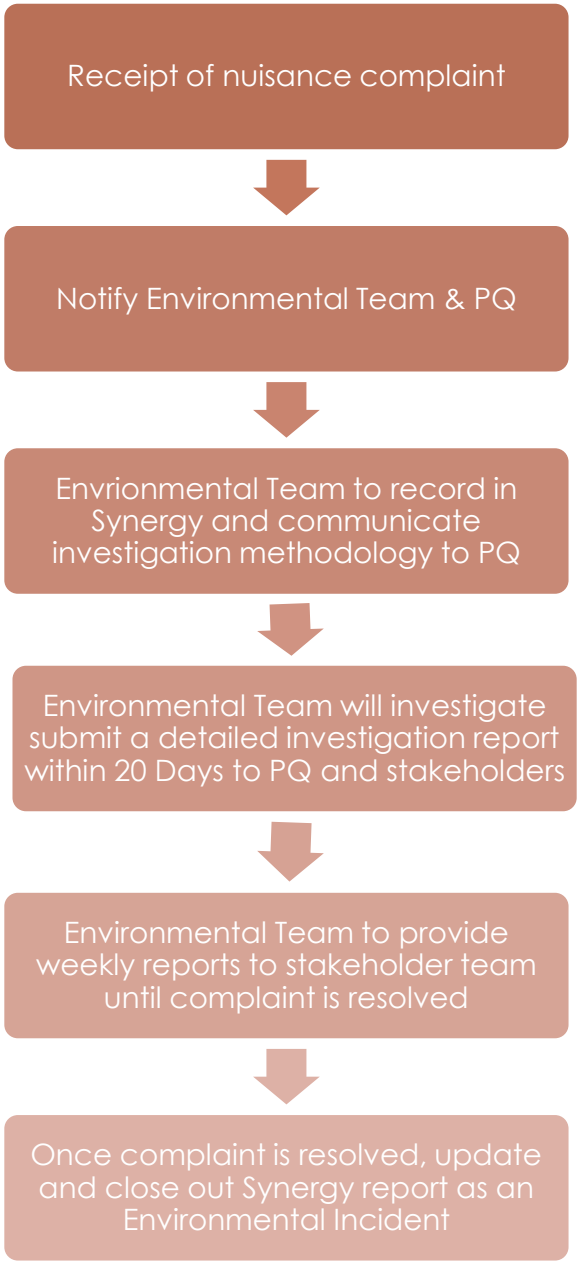

Figure 3: Complaint management protocol

11. Reporting

Reporting will be triggered upon receipt of a complaint in accordance with the CEMP and the Community Liaison Management Plan (CLMP).

Reporting will include:

- The receipt of complaint, including the complaint itself
- Any relevant site logbook recordings
- Any relevant meteorological reports
- Noise and Vibration monitoring inspections and audit results recorded by a suitably qualified person
- Results of Noise and Vibration monitoring undertaken during construction
- Noise and Vibration related incidents, complaints, or non-conformances.

12. Plan Review and Control

This plan shall be reviewed on a regular basis but not greater than 12 monthly intervals in accordance with the requirements specified in the

- JV Quality Management System requirements
- CEMP Review
- CopperString 2032, Powerlink – HSE Specification for Contractors and Suppliers, version B.

All the Project environmental management documents, review (version history) will be uploaded and maintained on In Eight or JV's Document Management Systems.

Appendix A Out of Hours Work Permit (Template)

Out of Hours Work (OOHW) Permit

This Permit is required when outlined by the site/project Environmental Management Plan or equivalent.

A copy of this Permit must be kept on site with the relevant Supervisor and be available for reference during works.

PART A: SCOPE, CONTACTS	
Project/Site Name:	
Supervisor of Works:	
Person applying for this permit *(if different from above):*	
Subcontractor(s) undertaking works:	
Description of Works:	
Location of works (Latitude/Longitude):	
Need/Justification for OOHW (what are the 'standard working hours'?):	
Planned Work Date From:	Time:
Planned Work Date To:	Time:

PART B: ENVIRONMENTAL ASSESSMENT & CONDITIONS

IMPACT ASSESSMENT

1. **Timing - Identify time when plant will be used (reference table).**
2. **Tick which plant to be used below and record whether to be used in Period 1 or Period 2, or both.**
   Refer to Appendix A for list of other Plant and equipment

Reference Table

Period	Time
Standard hours	Monday – Saturday 6:30 am to 6:30 pm (In accordance with OcG conditions (differs to Code of Practice)
Evening	Monday – Saturday 6:30 pm to 10:00 pm Sunday 7:00 am to 10:00 pm
Night	Sunday – Friday 10:00 pm to 6:30 am (following day) Saturday 10:00 pm to Sunday 7:00 am

Plant	Period	Plant	Period
☐ Rock breaker		☐ Mechanical broom	
☐ Dump truck		☐ Tip truck	
☐ Front end loader		☐ Construction truck	
☐ Excavator		☐ Cherry picker	
☐ Vibratory roller		☐ Concrete saw/corer	
☐ Water cart		☐ Concrete vibrator	
☐ Jackhammer		☐ Portable Generator	
☐ Bulldozer		☐ Compressor	
☐ Crane		☐ Backhoe	
☐ Semi trailer		☐ Mobile lighting tower	
☐ Concrete truck		☐ Bobcat	
☐ Piling rig		☐ Power tool	
☐ Compactor		☐ Concrete pump	
☐ Air drill		☐ Others	
☐ Welder			

Distance of work to nearest sensitive receptor: *(Provide map to show works area and surrounding receptors)*	

A MEMBER OF THE CIMIC GROUP

Sensitive receptor description:	
Presence and nature of any barriers or shielding between noise/vibration/light source and sensitive receptor(s):	
If required by the OOHW Protocol, has an acoustic assessment been conducted to measure impact?	
Assessment results / Mitigation Measures (List controls required) that will be undertaken as part of the works to minimise noise /light /vibration:	
Has the Community/Client/Local Council been notified of the OOHW?	
With controls in place (above), are the works likely to impact sensitive receptors based on noise/light/vibration profile or exceed minimum working distances?	☐ Yes ☐ No

PART C: AUTHORISATIONS

Environment Manager (or Delegate/Equivalent)

I have reviewed the information herein and acknowledge OOHW can proceed subject to conditions above.

Name:		Signature:		Date:	/ /

UGL Supervisor of Works / Project Manager (or Delegate/Equivalent)

I acknowledge OOHW will be undertaken in accordance with the requirements of this OOWH permit.

Name:		Signature:		Date:	/ /

Subcontractor Accountable Person

I acknowledge OOHW will be undertaken in accordance with the requirements of this OOWH permit.

Name:		Signature:		Date:	/ /

Workers involved in OOHW:

PART D: SIGN ON		
I have reviewed the permit requirements and will fully comply with all requirements/conditions:		
Name:	**Signature:**	**Date:**

Appendix A: Plant and Equipment Source Data

For guidance or interpretation, contact your UGL Environment Manager (or Delegate/Equivalent)

(reference: Transport for NSW 'Construction and Maintenance Noise Estimator')

Activity	Description of Activity	Plant/ Equipment	L_{Aeq} SWL	L_{Aeq} at 7m	Assumptions for quantitative assessment	
					No. Units	Activity total L_{eq} SWL
Mobilisation & Site Establishment	Installing construction boundary hoardings/ fences and traffic barriers	Truck (medium rigid)	103	78	4 per hour	**115**
		Road truck	108	83	4 per hour	
		Scissor Lift	98	73	1	
		Franna crane	98	73	1	
Utility, property, service adjustment	Adjustment of property boundaries (where required); relocation of services	Excavator (tracked) 35t	110	85	1	**116**
		Dump truck	110	85	4 per hour	
		Franna crane 20t	98	73	1	
		Pneumatic hammer	113	88	-	
		Concrete saw	118	93	1	
		Vacuum truck	109	84	-	
		Backhoe	111	86	-	
		Power generator	103	78	1	
Corridor Clearing	General land clearing, tree and stump removal, topsoil stripping, loading	Bulldozer D9	116	91	1	**121**
		Excavator (tracked) 35t	110	85	1	
		Chainsaw 4-5hp	114	89	2	
		Tub grinder/ mulcher 40-50hp	116	91	1	
		Dump truck	110	85	4 per hour	
	House/ building demolition	Excavator (tracked) 35t	110	85	1	**122**
		As above + hydraulic hammer	122	97	1	
		Front end loader 23t	112	87	1	
		Dump truck	108	83	4 per hour	
Rock crushing	Crushing and screening of building waste/ rock material for re-use on site	Rock crusher	118	93	1	**118**
		Bulldozer D9	116	91	1	
		Excavator (tracked) 35t	110	85	1	
		Dump truck	110	85	4 per hour	
Bulk earthworks	Formation of road alignment. Excavation of soil and rock, hammering/rock breaking, drilling, loading, haulage, compaction of fill areas, grading	Bulldozer D9	116	91	1	**123**
		Scraper 651	110	85	1	
		Excavator (tracked) 35t	110	85	1	
		As above + hydraulic hammer	122	97	1	
		Grader	113	88	1	
		Dump truck	110	85	8 per hour	
		Compactor	106	81	1	
		Roller (large pad foot)	109	84	-	
		Water cart	107	82	-	
Drainage infrastructure	Excavation of trenches and pits; Delivery and placement of precast pipes and pits; filling and compacting.	Backhoe	110	85	-	**115**
		Franna crane 20t	98	73	1	
		Excavator (tracked) 35t	110	85	1	
		Concrete truck	109	84	4 per hour	
		Truck compressor	75	50	1	
		Vibratory roller	109	84	1	
		Road truck	108	83	4 per hour	
Bridge works	Casting; concrete pours; Placement of pre-cast elements; Piling (mainly bored); and Demolition.	Franna crane 20t	98	73	1	**120**
		Piling rig - driven	116	91	-	
		Piling rig - bored	112	87	1	
		Power generator	100	75	1	
		Concrete pump	102	77	1	
		Concrete truck	109	84	4 per hour	
		Compressor	109	84	1	
		Pneumatic hammer	115	90	-	
		Welding equipment	105	80	-	
Retaining walls/ noise walls	Construction of retaining walls & noise walls	Piling rig - bored	112	87	1	**119**
		Power generator	103	78	1	
		Mobile crane	113	88	1	
		Concrete vibrator	113	88	1	
		Concrete pump	109	84	1	
		Welding equipment	105	80		
		Excavator (tracked) 35t	112	87	1	
		Air track drill	124	99		
	Delivery of raw materials.	Pavement laying machine	114	89	1	**118**

Activity	Description of Activity	Plant/ Equipment	L_{Aeq} SWL	L_{Aeq} at 7m	Assumptions for quantitative assessment	
					No. Units	Activity total L_{eq} SWL
Paving/ asphalting (incl concrete sawing)	Placement of surface material.	Dump truck	110	85	4 per hour	
	Saw cutting.	Asphalt truck & sprayer	103	78	1	
		Concrete truck	109	84	1	
		Smooth drum roller	107	82	1	
		Concrete saw	118	93	1	
Compounds	Deliveries.	Front end loader	91	66	1	**114**
	Plant and equipment.	Excavator (tracked) 35t	110	85	-	
	Maintenance.	Road truck	108	83	4 per hour	
	Office areas.	Compressor	109	84	1	
	Storage areas.	Welding equipment	105	80	1	
		Light vehicles	88	63	12 per hour	
		Power generator	103	78	1	
Road furniture installation	Signposting and line marking	Road truck	108	83	4 per hour	**110**
		Scissor lift	98	73	1	
		Franna crane 20t	98	73	1	
		Line marking truck	108	83	1	
Construction Compound Site Establishment		Chainsaw 4-5hp	114	89	2	**119**
		Pneumatic hammer	113	88	-	
		Fixed crane	113	88	1	
		Front end loader	112	87	1	
		Excavator (tracked) 35t	110	85	-	
		Grader	113	88	1	
		Vibratory roller	109	84	-	
		Concrete truck	109	84	4 per hour	
		Dump truck	110	85	4 per hour	
		Water cart	107	82	-	
		Concrete vibrator	113	88	1	
		Concrete pump	109	84	1	
		Power generator	103	78	1	
		Light vehicles (e.g. 4WD)	103	78		
Local Roads Works		Bulldozer D9	116	91	1	**120**
		Excavator (tracked) 35t	110	85	-	
		Chainsaw 4-5hp	114	89	2	
		Tub grinder/ mulcher 40-50hp	116	91	1	
		Front end loader	112	87	1	
		Scraper 651	110	85	1	
		Backhoe	111	86	-	
		Compactor	106	81	1	
		Dump truck	110	85	4 per hour	
		Road truck	108	83	4 per hour	
		Water cart	107	82	-	
Re-surfacing works	Milling the asphalt to expose the underlying concrete, then laying new asphalt	Daymakers	98	73	2	**118**
		Pavement profiler	117	92	1	
		Dump truck	110	85	4 per hour	
		Front end loader	112	87	1	
		Pavement laying machine	114	89		
		Asphalt truck & sprayer	106	81		
		Smooth drum roller	107	82		
Other		Airtrack Drill	126	101		
		Diamond Grinding	126	101		
		13.5T Excavator With Hammer	122	97		
		13.5T Excavator	104	79		
		5T Excavator With Hammer	119	94		
		5T Excavator	100	75		
		2.5T Smoothdrum Roller	105	80		
		Plate Wacker	104	79		
		Hand Power Tool	105	80		
		Jumping Jack	107	82		
		Soft Cut Saw	105	80		
		Brushcutter	110	85		
		Blower	104	79		
		Vacuum Truck	106	81		
		Kanga Hammer	108	83		

Activity	Description of Activity	Plant/ Equipment	L_{Aeq} SWL	L_{Aeq} at 7m	Assumptions for quantitative assessment	
					No. Units	Activity total L_{eq} SWL
		Pole Saw	107	82		
		Flocon	106	81		
		Bobcat with Planer	110	85		
		Bobcat	104	79		
		Compressor (Towable) / Lawn Mower	100	75		
		Hand Power Tools (2-3 Items)	110	85		
		Abrasive Blasting	117	92		
		Truck Mounted Borer	107	82		
		Microdrilling Rig (Soilmec SM-5)	115	90		
		Microdrilling Rig (Soilmec SM-14)	105	80		
		Excavator Dumping Rubbles	114	89		

Appendix B Out of Hours Work Protocol

Powerlink QUEENSLAND | COPPERSTRING 2032

UGL CPB CONTRACTORS
UGL CPB Joint Venture

OUT OF HOURS WORKS PROTOCOL

COPPERSTRING 2032

Approvals and Reviews

Noise and Vibration Management Plan	
Project	CopperString 2032
Client	Powerlink Queensland
Document Number	CSPW-EVN-PLN-900-000020_Appendix B

Revision History					
Rev No.	Description of Revision	By	Checked	Approved	Date
A01	Developed for PDLA Work Contract	Jacinta Fuller	David Mclean	Matt Lennon	20/05/2024

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Table 1: Abbreviations and definitions

Abbreviation	Definition
CopperString 2.0	Copperstring2032 (the Project)
CEMP	Construction Environmental Management Plan
CLMP	Community Liaison Management Plan
CoG Report	Coordinator General evaluation report on the environmental impact statement
EIS	Environmental Impact Statement
EMF	Environmental Management Framework
EP Act	*Environmental Protection Act 1994*
EPP (Noise)	*Environmental Protection (Noise) Policy 2019*
Inaudible works	Works modelled as having noise levels below the external construction noise criteria for accommodation in Table 3
NVMP	Noise and Vibration Management Plan
NWMP	Northwest Minerals Province
NQ	North Queensland
NWPS	Northwest Power System
NEM	National Electricity Market
OOHW	Out of Hours Works, undertaken outside the standard daylight construction hours of 6:30 am to 6:30 pm Monday to Saturday (excluding public holidays)
PQ	Powerlink Queensland
UGL CPB JV	UGL/CPB Contractors Joint Venture

1. Introduction

1.1 Purpose

This Out of Hours Works (OOHW) Protocol is an appendix to the Noise and Vibration Management Plan. It has been prepared to define the process for the assessment, management and approval of works proposed to be conducted outside of the standard daytime construction hours 6:30am to 6:30 pm Monday to Saturday. This Protocol is applicable to all activities conducted by site personnel (including sub-contractors) outside standard daytime construction hours, i.e. out of hours works (OOHW).

1.2 Objectives

This OOHW protocol has been developed in accordance with the environmental management obligations of the Project.

The objectives of this protocol are to:

- Minimise impacts on nearby sensitive receptors during construction of the CopperString 2032 Project (the Project)
- Comply with the environmental management obligations for the Project.

2. Project Environmental Management Obligations

Construction of the Project must comply with environmental legislation and guidelines, and any additional requirements specified in approval conditions.

Specific legislative and other requirements relevant to this plan are detailed below.

2.1 Commonwealth Legislation

Commonwealth legislation that is relevant to the Project and this plan includes:

- *Environment Protection and Biodiversity Conservation Act 1999.*

2.2 State Legislation

State legislation that is relevant to the Project and this plan includes:

- *Planning Act 2016*
- *Environmental Protection Act 1994*
- *Electricity Act 1994*
- *Environmental Protection (Noise) Policy 2008*
- *Environmental Protection Act 1994*

2.3 Standards and Guidelines

Standards and guidelines that are relevant to the Project and this plan include:

- Australian Standard AS 1055.1-1997 Acoustics – Description and Measurement of Environmental Noise General Procedures
- Queensland EPA Noise and vibration from blasting guideline
- Queensland EPA Planning for Noise Control guideline
- Transport Noise Management Code of Practice: Volume 2 – Construction Noise and Vibration (Department of Transport and Main Roads, 2023)
- Noise Measurement Manual (Department of Environment and Science, 2020).

2.4 Conditions of Approval – Requirements and Commitments Schedule

Table 2 summarises the requirements and commitments that are relevant OOHW on the Project and notes where they have been addressed in this plan.

Table 2: Environmental requirements and obligations relevant to this plan

Ref	Requirement	Where addressed
Coordinator General's Report, Appendix 1 Part 1		
A3 (b) (xii)	The proponent must prepare a communications and stakeholder engagement plan (CSEP) that is to be submitted as part of the SIMP to the Coordinator General for approval, in accordance with Condition 2 of this part: (xii) processes for providing advanced notice to the stakeholder of construction activities, including: any works which may occur outside of standard working hours; interruptions to utility services; transmission line stringing by helicopter; changed traffic or property access conditions; or periods of high noise, vibration or traffic activities	Community Liaison Management Plan (CLMP)
CopperString 2.0 Environmental Impact Statement Commitments		
C10	Where work is proposed to be conducted in proximity to a sensitive receptor, the timing of construction will consider the noise, dust, vibration and light impacts of the construction process and of access issues.	Section 3
C12	At laydown/delivery areas along the transmission line, deliveries will occur in a manner not to cause nuisance to a sensitive receptor (occupier of a building) outside of the hours of 6.30 am to 6.30 pm Monday to Saturday (as per the requirements of the Environmental Protection Act 1994).	Section 4.2
HSE Specification for Contractors and Suppliers (CSPW-HSW-SPE-M8-000001, revision B)		
9.16 Noise and Vibration	The Contractor must adhere to all relevant legislative requirements regarding permitted hours of work and the use of regulated devices. The Contractor must ensure minimisation of noise or vibration nuisance via the following requirements:	
	a) Limit work hours to between 6.30am to 6.30pm Monday to Saturday (excluding public holidays) for construction work. Work is not to occur outside these hours unless permitted by a Development Approval, or it is in an emergency, due to limited line outages, maintenance activity, or other exceptional circumstances.	Section 3
	b) Noise limits apply to the use of regulated devices (only between 7am and 7pm Monday to Saturday – excluding public holidays) including compressors or generators; grass cutters; impact tools; leaf blowers or mulchers; oxyacetylene burners; electrical, mechanical or pneumatic power tools (chainsaws, drills, sanders, electric grinder, nail gun).	Section 4.3.3
	g) Deliver and/or remove materials and equipment to and from the site within the approved hours for construction. All transport vehicles will be in good working order and will avoid using exhaust brakes in built up areas adjacent to the work site.	Section 4.2

3. Project requirements

To minimise noise impacts construction of the Project will be undertaken, where possible, during the standard daylight construction hours of 6:30 am to 6:30 pm Monday to Saturday (excluding public holidays) when in proximity to residences.

The nature and methodology of construction is also driven by the need to address technically justified requirements for the purpose of construction. This technical justification encompasses a range of aspects linked to the methodology and technical requirements associated with the construction. To address these requirements this Out of Hours Protocol has been developed.

The protocol provides for works that may be undertaken outside standard daylight construction hours in the following circumstances:

1. Where required in an emergency to avoid injury or the loss of life, to avoid damage or loss of property or to prevent environmental harm
2. Operation of generators at Camps where mains power is insufficient for camp operation
3. Delivery of materials and equipment, where required by the Police or another authority for safety reasons
4. Construction activities are inaudible (i.e. below the external construction noise criteria for accommodation in Table 3) at the closest sensitive receptor
5. Where a utility service operator has advised the works cannot be undertaken during standard daylight construction hours as this will result in a high risk to the operation or integrity of the network
6. Construction activities are technically justified, including:
    a. Operation of concrete batching plants where technical specifications require adequate management of concrete mix designs for construction (Significant temperatures can directly affect batch plant operation and operations).
    b. Operation of pumps for the purpose of water extraction where limited water supplies exist. Specifically, where flow rates are less than 14 l/sec and a turkeys nest or equivalent is required for sufficient construction water for the Project works.

Where works are undertaken outside standard daylight construction hours the process within Section 4 will be followed, including seeking approval for the OOHW. No out of hours works will be undertaken without an approved OOHW permit.

4. OOHW assessment and approval procedure

Where works are undertaken outside standard daylight construction hours the process within Figure 1 and this section will be followed.

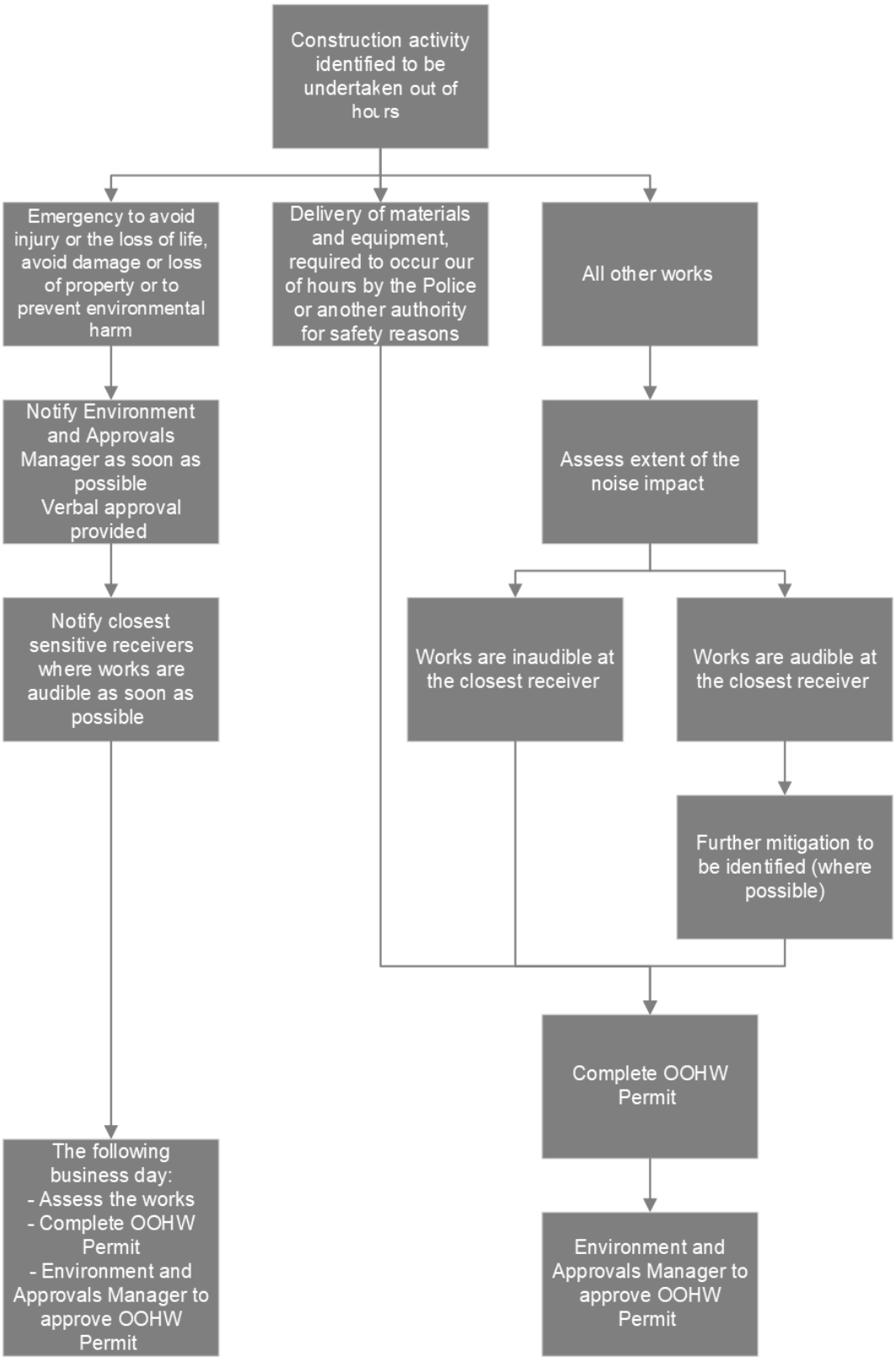

Figure 1: Out of hours works assessment and approval process

4.1 Emergency

Works outside standard daylight construction hours may be required in the event of an emergency to avoid injury or the loss of life, to avoid damage or loss of property or to prevent environmental harm. In the event of an emergency the Environment and Approvals Manager will be contacted as soon as possible to:

- Confirm that the works are an emergency
- Provide verbal approval.

If the works are likely to be audible at sensitive receptors they will be notified as soon as possible, via either phone call, text message or door knock.

The following business day an OOHW Permit (refer to Appendix A of the Noise and Vibration Management Plan) will be completed retrospectively for the works and provided to the Environment and Approvals Manager for written approval.

4.2 Delivery of materials and equipment

Works may be required by the Police or another authority outside standard daylight construction hours for the delivery of plant and equipment for safety reasons.

Following the identification of the need for a delivery outside standard daylight construction hours an OOHW Permit (refer to Appendix A of the Noise and Vibration Management Plan) will be completed. It will be provided to the Environment and Approvals Manager for approval at least 5 business days prior to the delivery.

The following mitigation will be implemented as a minimum during deliveries outside standard daylight construction hours:

- Transport routes will avoid sensitive areas as far as practicable, in accordance with the Road Use Management Plan agreements with Council / Department of Transport and Main Roads
- Vehicles are not to park up in local streets i.e. to not cause excess noise after business hours in built up areas
- Heavy and noisy vehicles will not use access points near sensitive receptors where possible
- The construction site will be arranged to limit the need for reversing associated with regular / repeatable movements to minimise the use of reversing alarms
- Vehicles will not be left idling and be switched off when not in use for more than 15 minutes.

4.3 All other works

4.3.1 Noise assessment

An assessment will be completed for all other OOHW by a member of the Environment Team to determine the magnitude and extent of the noise impact that the construction activity could potentially have upon nearby sensitive receptors. The level of assessment shall be commensurate with the potential magnitude and extent of the impact.

As a minimum the noise assessments shall quantitatively assess the noise levels for the worst case scenario for proposed OOHW. The noise assessment will be based on the typical noise levels included within Table 7 and Appendix A (OOHW Permit) of the Noise and Vibration Management Plan.

The modelled noise levels will be compared against the external construction noise criteria for accommodation (refer to Table 3) and further mitigation will be implemented if the objectives are exceeded. Where a rating background level (RBL) has not previously been determined it will be confirmed prior to the noise assessment using the process outlined within the *Transport Noise Management Code of Practice: Volume 2 – Construction Noise and Vibration* (Department of Transport and Main Roads, 2023) (Code of Practice).

Table 3: External construction noise criteria for accommodation

Work Period		External Noise Level $L_{Aeq,adj,15\ min}$ [4,5], dB(A)	
		Lower Limit	Upper Limit
Standard hours	Monday – Saturday 6:30 am to 6:30 pm (In accordance with OcG conditions (differs to Code of Practice)	RBL + 10 [1][2][3]	75 Where: RBL > 55
			70 Where: 40 < RBL ≤ 55
			65 Where: RBL ≤ 40
Non-standard hours – Day / Evening	Monday – Saturday 6:30 pm to 10:00 pm Sunday 7:00 am to 10:00 pm	RBL + 5 [3]	RBL + 5 [3]
Non-standard hours – Night	Sunday – Friday 10:00 pm to 6:30 am (following day) Saturday 10:00 pm to Sunday 7:00 am	RBL + 5 [3]	RBL + 5 [3]

Notes:
[1] RBL + 5 dB(A) should be considered where a facility, equipment and long-term earthworks are required in an area for greater than six months. Where this occurs, the minimum lower limit is 45 dB(A) for Standard hours.
[2] Where the lower limit value exceeds the upper limit value, the lower limit is taken to equal the upper limit value.
[3] Minimum lower limit is 50 dB(A) for Standard hours and 45 dB(A) for Non-Standard hours. A maximum lower/upper limit of 75 dB(A) applies to Non-Standard hours.
[4] Noise contribution from construction activity determined as the component level (that is, noise from construction activity only).
[5] The noise level from construction includes adjustment factors from Table 2.1.2.1(b) of the *Transport Noise Management Code of Practice: Volume 2 – Construction Noise and Vibration* (Department of Transport and Main Roads, 2023) (for example, low frequency noise, impulsivity, tonality, intermittency and modulation).

4.3.2 Inaudible works

Where noise levels from the works are assessed as inaudible (i.e. below the external construction noise criteria for accommodation in Table 3) at the closest sensitive receptor an OOHW Permit (refer to Appendix A of the Noise and Vibration Management Plan) will be completed. It will be provided to the Environment and Approvals Manager for approval at least 5 business days prior to the commencement of the works.

4.3.3 Audible works

Where noise levels from the works are assessed as audible (i.e. exceed the external construction noise criteria for accommodation) at the closest sensitive receptor the construction activity method and plant list will be reviewed to confirm if further mitigation measures can be implemented to reduce the noise impact (refer to Table 4 for measures which may be applied).

Following the identification of applicable mitigation the noise assessment may be revised to take into account any noise reductions associated with the mitigation measures.

Where noise levels from the works are assessed as inaudible (i.e. below the external construction noise criteria for accommodation) at the closest sensitive receptor an OOHW Permit (refer to Appendix A of the Noise and Vibration Management Plan) will be completed. It will be provided to the Environment and Approvals Manager for approval at least 5 business days prior to the commencement of the works.

Table 4: Mitigation measures which may be applied for out of hours works

Action required	Details
Implement community consultation or notification measures	Notification detailing work activities, dates and hours, impacts and mitigation measures, indication of work schedule over the night-time period, and contact telephone number. Notification should be a minimum of 5 and a maximum of 10 business days prior to the start of works. Phone call with affected receptor Email notification to affected receptors Contact telephone number for community

Action required	Details
Site inductions	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • Project specific and relevant standard noise and vibration mitigation measures • Standard daylight construction hours • Any limitations on high noise generating activities • Location of nearest sensitive receptors • Designated loading/unloading areas and procedures
Behavioural practices	No swearing or unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items and slamming of doors.
Construction hours and scheduling	Where feasible and reasonable, construction should be carried out during the standard daylight construction hours. Work generating high noise levels should be scheduled during less sensitive time periods. Regulated devices, such as lawn mowers, line trimmers, mulchers, leaf blowers, generators, compressors, and power tools will not be used outside the following hours where audible at the closest sensitive receptor: • Before 7am and after 7pm Monday to Saturday • Before 8am and after 7pm Sunday and public holidays.
Equipment selection	Use quieter and less vibration emitting construction methods where feasible and reasonable, e.g. when piling is required, bored piles rather than impact-driven piles will minimise noise and vibration impacts. Ensure plant including the silencer is well maintained.
Rental plant and equipment.	The noise levels of plant and equipment items are to be considered in rental decisions and in any case cannot be used on site unless compliant with the criteria in the Noise and Vibration Management Plan.
Use and siting of plant.	The offset distance between noisy plant and adjacent sensitive receptors is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receptors. Only have necessary equipment on site.
Plan worksites and activities to minimise noise and vibration.	Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site. Where additional activities or plant may only result in a marginal noise increase and speed up works, consider limiting duration of impact by concentrating noisy activities at one location and move to another as quickly as possible.
Reduced equipment power	Use only the necessary size and power
Non-tonal reversing alarms	Non-tonal reversing beepers (or an equivalent mechanism) will be fitted and used on all construction vehicles and mobile plant regularly used on site in close proximity sensitive receptors.
Minimise disturbance arising from delivery of goods to construction sites.	Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receptors. Select site access points and roads as far as possible away from sensitive receptors. Dedicated loading/unloading areas to be shielded if close to sensitive receptors. Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible. Avoid or minimise these out of hours movements where possible.
Engine compression brakes	Limit the use of engine compression brakes at night and in residential areas.

Action required	Details
	Ensure vehicles are fitted with a maintained Original Equipment Manufacturer exhaust silencer or a silencer that complies with the National Transport Commission's 'In-service test procedure' and standard.
Shield stationary noise sources such as pumps, compressors, fans etc.	Stationary noise sources should be enclosed or shielded where feasible and reasonable whilst ensuring that the occupational health and safety of workers is maintained. Appendix D of AS 2436:2010 lists materials suitable for shielding.
Shield sensitive receptors from noisy activities.	Use structures to shield residential receptors from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practicable) and consideration of site topography when situating plant.

4.4 OOHW community consultation and communication

The Project team respects that it is a guest in the local community and will therefore work hard to develop rapport with the nearby sensitive receptors. The Project will seek to conduct all works during standard daylight construction hours in the first instance, and where this is not possible, look for opportunities to limit the level of impact.

A suite of communication tools and activities will be utilised as required to target the relative audience based on the nature of works and the potential impacts to provide clear, effective and timely information.

Based on this structure the community would, for example, be provided with and/or have access to:

- Project wide information such as the Project website
- Area specific information such as updates posted on the Project website and letterbox drops regarding specific impacts or changes to planned works
- Two-way communication access such as phone calls, individual briefings, access to the Project information line and email enquiries facility, and community information sessions.

Additionally, the Project will distribute OOHW notifications to the sensitive receptors a minimum of 5 and a maximum of 10 business days prior to the start of works.

Further details of the Project community and communication strategy are provided in the Community Liaison Management Plan.

4.5 OOHW enquiries and complaints management

The Project will implement Enquiries and Complaints Management and Dispute Resolution Processes to support an active response to community and stakeholder enquiries and concerns about the Project's activities and potential impacts.

This formal process will be available for stakeholders to register their enquiries and complaints. These will be managed in a responsive and timely manner so that stakeholders feel their concerns are being genuinely addressed and not dismissed.

The formal process will assist in building a relationship of trust and reliability between the community and Project team. Details of enquiries and complaints will be recorded and monitored in the Consultation Manager database.

The following process will be used for handling enquiries and complaints (refer to Figure 2):

- The Project team member who receives the enquiry / complaint (written or verbal) will record it in Consultation Manager and forward it to a member of the Community and Stakeholder Engagement (CSE) Team immediately
- If approached directly by a community member with a complaint, the Project team member will listen to the person's concerns and advise them to contact the CSE Team. Alternatively, the team member will ask for the person's contact details and advise that a CSE Team member will be in contact as soon as possible
- The CSE Team member will report to the Community and Stakeholder Manager, who will escalate to Powerlink if the issue could result in ministerial, media or negative community interest
- If the enquiry / complaint can be resolved by the Project team, the CEM will nominate someone from the CSE Team or wider Project team to ensure a timely response and appropriate action

- The CEM will oversee the enquiry / complaint until resolved. If a complaint cannot be resolved, it will be escalated to Powerlink.

In accordance with the Powerlink Collaboration Framework and associated protocols, the following response timeframes will be applied.

Table 5: Response timeframes

Project contact	Response time
Email	Automated acknowledgement of receipt Customised acknowledgement within 24 hours Standard enquiries to be closed out within three business days Simple complaints to be closed out within five business days
Phone	Acknowledgement of receipt noted within 24 hours (return call or text) Standard enquiries responded to in full within three business days Simple complaints to be closed out within five business days
Online enquiry / feedback form	
Letter	
Note: Enquiries and complaints requiring more complex investigation to be closed out within seven business days. If this cannot be achieved, provide stakeholder with updates to advise team is still looking into the matter.	

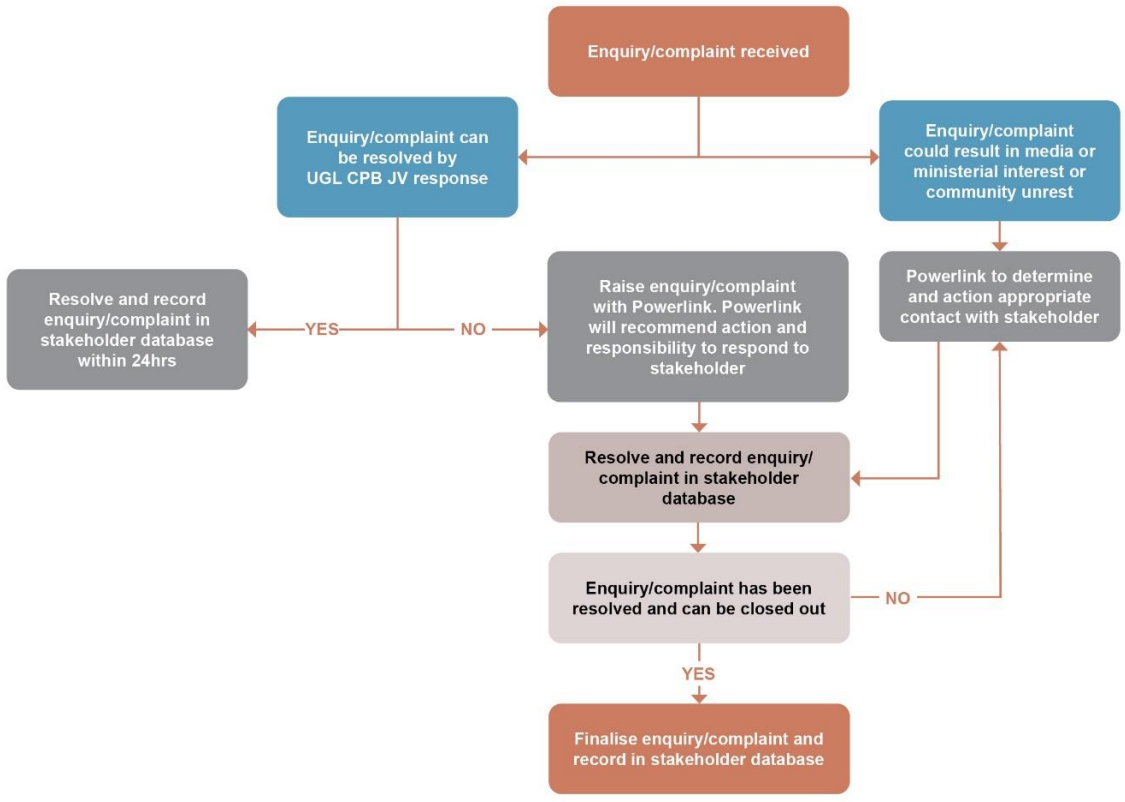

Figure 2: Enquires and complaints process

5. Monitoring and recording

All monitoring will be conducted in accordance with the Noise and Vibration Management Plan and the relevant Australian Standard / guidelines.

5.1 Noise monitoring

The following noise monitoring will be undertaken for OOHW:

- As required by the applicable noise assessments for the works
- In response to complaints as determined by the Project Environment and Approvals Manager.

Monitoring results will be recorded on noise/vibration monitoring forms.

5.2 OOHW exceedances and non-conformances

Where noise monitoring identifies exceedances of predicted noise levels, a review of OOHW activity will be undertaken to ensure it is being conducted in accordance with the noise assessment undertaken for the works. Where activities are in accordance with the noise assessment but are still exceeding predicted levels, the following will be undertaken:

- Confirm that monitored levels are not being impacted by other noise or vibration sources
- Confirm if the exceedance is due to an uncharacteristically loud piece of equipment
- Identify if equipment can be swapped out for another piece of equipment or alternative equipment or plant
- Implement other feasible and reasonable measures which may include reducing plant size, modify time of works, changing operational settings, and utilising alternate construction methodology or a combination of these.

All exceedances of predicted noise levels as well as any necessary corrective actions undertaken will be recorded.

Powerlink QUEENSLAND | COPPERSTRING 2032

UGL CPB CONTRACTORS
UGL CPB Joint Venture

WATER QUALITY MANAGEMENT PLAN

COPPERSTRING 2032

EDMS No : CSPW-EVN-PLN-900-000021
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Approvals and Reviews

Water Quality Management Plan	
Project	CopperString 2032
Client	Powerlink Queensland Pty Ltd
Document Number	CSPW-EVN-PLN-900-000021

Revision History					
Rev No.	Description of Revision	By	Checked	Approved	Date
A01	Initial draft for PLQ review	Jacinta Fuller	David McLean	Matt Lennon	03/05/2024
A02	Incorporating PQ Feedback received on 30/05/2024	Jacinta Fuller / Stephan Gabas	David McLean	Matt Lennon	06/06/2024

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Appendices

Appendix A Dewatering Management Plan

1. Introduction

The purpose of the CopperString 2032 project is to connect the North West Minerals Province (NWMP) of Queensland to the National Electricity Grid. This will not only allow existing loads in the Mount Isa and Cloncurry areas to be fed from the National Electricity Market (NEM), but also provide access to new mining loads and opportunity for connection of renewable generation.

1.1 Project scope

The CopperString 2032 Project is an extra high voltage transmission system intended to connect the North West Power System (NWPS) near Cloncurry and Mount Isa to the Powerlink network and NEM at Mulgrave. Figure 1 provides an overview of the Project.



Figure 1 CopperString 2032 proposed transmission lines and substations

The CopperString 2032 Project will connect the NWMP to the NEM to reduce the cost of power supply and facilitate the large-scale development of the Hughenden wind resource and solar resources within the North Queensland Clean Energy Hub (NQCEH).

The scope of work, traversing east to west, consists of the following sections:

- Mulgrave 500/275kV Substation as the CopperString 500kV connection point to the Queensland SuperGrid and 275kV line augmentation as the CopperString 275kV connection point to the NEM
- Pentland 500kV Substation to support the North Queensland Clean Energy Hub (NQCEH) expansion and as the core for future load connections in the area
- Flinders 500/300kV Substation (Hughenden) as the core for the NQCEH
- Dajarra Road 330/220kV Substation (Cloncurry) as the core for distributions to larger load centres
- The primary CopperString transmission backbone
- Termination via the Mount Isa augmentation 220/132kV.

The scope consists of a transmission line between the above locations carrying extra high voltage power transmission at 500kV, 330kV and 220kV respectively. Substations at the abovementioned interconnecting junctions will distribute power to the NWMP and NQCEH.

1.2 Abbreviations, acronyms & definitions

Table 1 Abbreviations, acronyms & definitions

Term	Definition
ASS	Acid Sulfate Soils
Compliance audit	Verification of how implementation is proceeding with respect to a CEMP (which incorporates the relevant Approval conditions)
CMS	CPB Management System/ UGL Management system as referenced
CPB	CPB Contractors Pty Ltd
UGL	UGL Engineering Services Pty Ltd
EMP	Environmental Management Plan
EMS	Environmental Management System
Environmental aspect or hazard	Defined by AS/NZS ISO 14001 as an element of an organisation's activities, products or services that can interact with the environment. The term 'hazard' is used throughout this CEMP and has the same meaning as 'aspect' for th purposes of compliance with ISO14001 requirements.
Environmental impact	Defined by AS/NZS ISO 14001 as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects.
Environmental incident	An unexpected event that has, or has the potential to, cause harm to the environment and requires some action to minimise the impact or restore the environment.
Environmental objective	Defined by AS/NZS ISO 14001 as an overall environmental goal, consistent with the environmental policy, that an organisation sets itself to achieve.
Environmental policy	Statement by an organisation of its intention and principles for environmental performance.
Environmental target	Defined by AS/NZS ISO 14001 as a detailed performance requirement, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to set and met in order to achieve those objectives.
ESCP	Erosion and Sediment Control Plan
EWMS	Environmental Work Method Statement
Hold point	A verification point that prevents work from commencing prior to approval from the appointed authority.
Non-compliance	Failure to comply with the requirements of the Project approval or any applicable licence, perr or legal requirements
Non-conformance	Failure to conform to the requirements of Project system documentation including this management plan or supporting documentation
PESCP	Progressive Erosion and Sediment Control Plan
SEP	Site Environmental Plan(s)
WQPSC	Water Quality Policy Sub Committee
NWRC	National Water Reform Committee

2. Project Environmental Management Obligations

2.1 Project environmental management obligations

The Project involves construction and operation of approximately 1,000km of extra high voltage overhead electricity transmission line that will connect the Northwest power system to the state electricity grid. The project includes six (6) new substations, electricity transmission line and transmission towers every 500-600 meters (m). To support construction of the project six construction camps, site offices, laydown/delivery areas, concrete batching plants, and access tracks to the corridor and along its alignment will be provided. The project also provides for improved communications, with the installation of fibre optic cables.

The Coordinator General (CoG) for the Department of State Development, Infrastructure, Local Government and Planning declared the project to be a 'coordinated project' under *the State Development and Public Works Organisation Act 1971* (SDPWO) requiring an Environmental Impact Statement (EIS) for the Project. In September 2022, the Coordinator General provided an evaluation report (CoG Report) on the submitted EIS for the project. This report includes an evaluation of Matters of National Significant (MNES) with recommended conditions for an approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth). In November 2022, a notification of approval was granted from the Department of Climate Change, Energy, the Environment and Water (DCCEEW) (Commonwealth) under the EPBC Act with conditions specific to the Project.

The CoG report also includes recommended conditions for proposed subsequent Ministerial Infrastructure Designations for consideration under the *Planning Act 2016* (Qld) by the Queensland Planning Minister.

The CoG evaluation was based on the draft and revised EISs, submissions made, public consultation on the draft EIS and advice from relevant Australian, State and Local government agencies.

To address and comply its legislative obligations, the UGLCPB JV has prepared a Regulatory Approvals Plan (refer Fig 2) which identifies the environmental approvals applicable to the Project.

The project scope includes (but not limited to):

- Clearing vegetation and earthworks for a transmission line and ancillary infrastructure (e.g. off-easement access tracks and water sources) involving:
  - Disturbance to Matters of National Environmental Significance
  - Disturbance to Matters of State Environmental Significance
  - Interfering with protected species (flora and fauna)
  - Works within Native Title claimed areas
  - Land affected by Unexploded Ordnance (UXO)
- Constructing and operating accommodation hubs with facilities including:
  - Clearing regulated vegetation
  - Accommodation units and offices, and carparking (involving building and plumbing and drainage works)
  - Mains connection (power, water and sewerage)
  - Mobile and temporary concrete batching plants
  - Motor vehicle workshop
  - Fuel (chemical) storage
  - Water treatment, for provision of drinking water
  - Wastewater (sewage) treatment
  - Biosecurity washdown bays
- Taking water (surface and groundwater)
- Use of quarry material from commercial sources, although project specific borrow pits may be identified as an opportunity
- Crossing mapped waterways and water courses for access
- Upgrading public roads

- Working within and adjacent to rail corridors
- Disposing of contaminated soil (if found within properties listed on the Environmental Management Register (EMR)).

2.2 Relevant legislation and guidelines

Construction of the project must comply with environmental legislation and guidelines, and any additional requirements specified in approval conditions.

Specific legislative and other requirements relevant to this plan are detailed below.

2.2.1 Commonwealth legislation

Commonwealth legislation that is relevant to the project and this plan includes:

- *Environment Protection and Biodiversity Conservation Act 1999.*

2.2.2 State legislation

State legislation that is relevant to the project and this plan includes:

- *Environmental Protection Act 1994*
- *Environmental Protection (Water and Biodiversity) Policy 2019*
- *Coastal Protection and Management Act 1995*
- *Planning Act 2016*
- *Vegetation Management Act 1999*
- *Fisheries Act 1994*
- *Water Act 2000*
- *Water Supply (Safety and Reliability) Act 20008*
- *State Development and Public Works Organisation Act 1971.*

2.2.3 Standards and guidelines

Standards and guidelines that are relevant to the project and this plan include:

- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG,2018)
- Queensland Water Quality Guidelines 2009 (DEHP, 2009)
- Monitoring and Sampling Manual: Environmental Protection (Water) Policy 2009 (DES, 2018).

3. Management Plan Interface

This Water Quality Management Plan (WQMP) is an overarching sub-plan, informing the Construction Environmental Management Plan (CEMP) as identified below in the Environmental Management Framework (EMF).

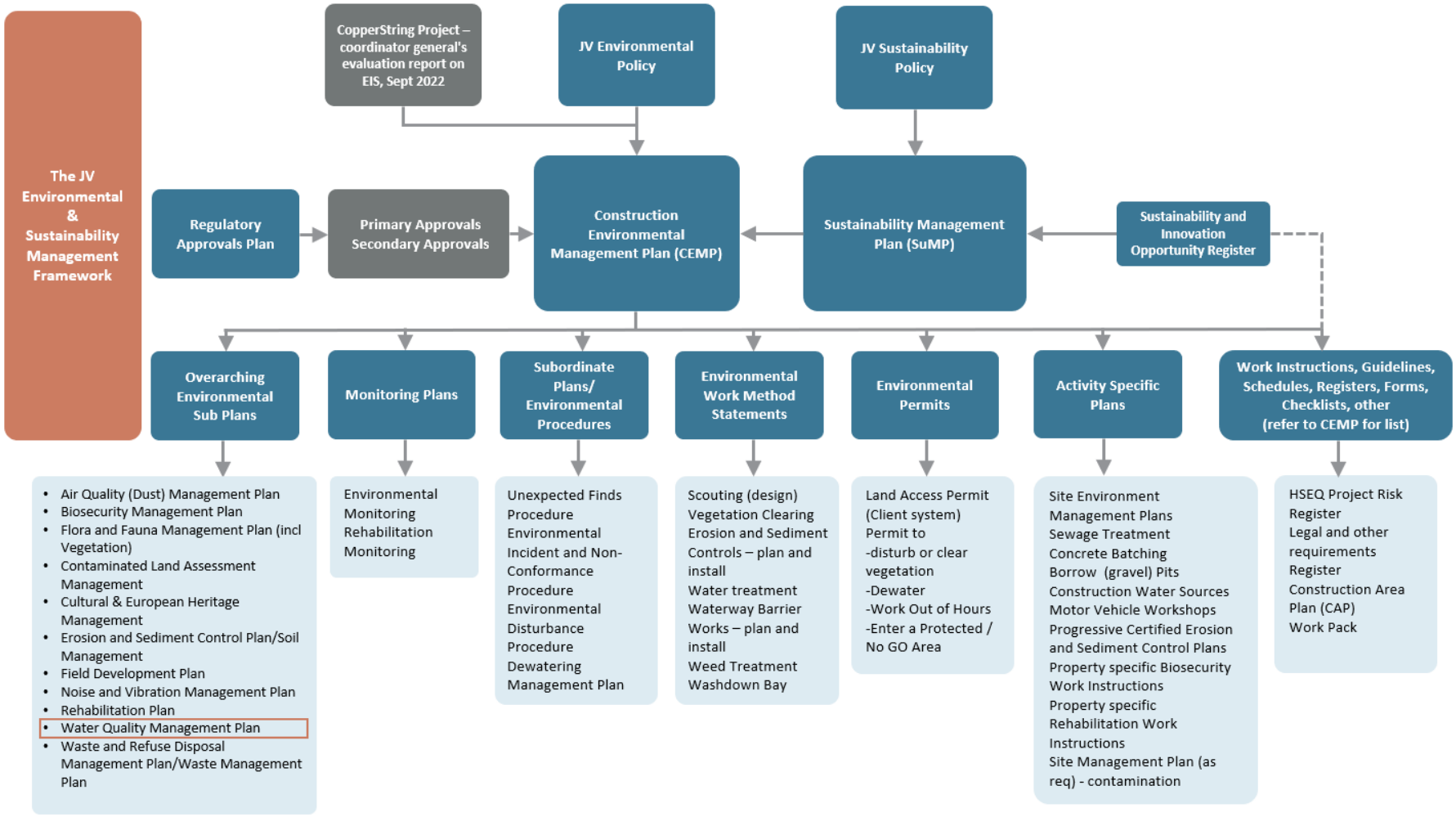

Figure 2 Environmental Management Framework – WQMP interface

3.1 Conditions of approval – Requirements and commitments schedule

Table 2 summarises the water quality requirements and commitments that are relevant to the project and notes where they have been addressed in this plan

Table 2 Environmental requirements and obligations relevant to this plan

Ref	Requirement	Where addressed
Coordinator General's Report, Appendix 2 Part B		
B28	(a) Prior to commencement of works, an Erosion and Sediment Control Plan (ESCP) is to be developed and implemented as part of the CEMP as identified in requirement/condition 33 (below). (b) Following completion of construction works, the proponent is to develop and implement an OEMP for mitigation of potential water quality impacts during operation of the project. The OEMP is to include actions to mitigate impacts from stormwater, flooding and impacts to water quality and surface or groundwater water users.	Refer to Section 6 and Erosion Sediment Control Management Plan
B33(a)	Prior to the commencement of works, prepare and submit a Construction Environmental Management Plan (CEMP) to DSDILGP (infrastructuredesignation@dsdlgip.qld.gov.au). The CEMP must be consistent with management measures detailed in the project EIS and, and must include/address the following:	
B33(a)(i)	an Erosion and Sediment Control Plan (ESCP) developed in accordance with the Best Practice Erosion and Sediment Control Document, prepared by the International Erosion Control Association and dated November 2008, and Queensland's Construction Phase - Stormwater Management Design Objectives, prepared by the then Department of Infrastructure, Local Government and Planning and dated July 2017, that addresses/includes: • a suitably detailed description of the existing environment • a suitably detailed description of proposed clearing and the post-clearing land use • an erosion hazard and risk assessment associated with both: -- the vegetation clearing operations -- the post-clearing activities on the development site • a detailed description of the proposed erosion and sediment control measures applicable during: -- the vegetation clearing operations -- the subsequent land use - details of the proposed performance monitoring program and an ESCP review process	Refer to Section 6 and Erosion Sediment Control Management Plan
B33(a)(v)	a dewatering management plan that establishes suitable protocols to treat or remove water from the site, should it be required during construction	Refer to Section 6 and Appendix A
CopperString 2.0 Environmental Impact Statement Commitments		
C17	The Construction Environmental Management Plan shall include erosion and sediment control measures which takes into consideration the International Erosion Control Association's Best Practice Erosion and Sediment Control Guidelines (IECA, 2008). The plan will include onsite drainage, stormwater runoff control, vegetation clearing, earthworks, site exit and egress points and soil stockpile management.	Refer to Section 6 and Erosion Sediment Control Management Plan

Ref	Requirement	Where addressed
C50	CuString will develop Road Use and Traffic Management Plans which will address wet weather aspects associated with the use of unsealed access tracks. Many soils in the study area are susceptible to varying types of erosion. To mitigate this impact, an erosion and sediment control plan will be developed prior to construction and implemented. These plans will include measures to avoid, manage or mitigate potential risk to soils, including specific reference to management/mitigation of risks associated with salinity, specifically providing evidence of no clearing in salinity expression areas. This will be used in conjunction with a vegetation management plan and rehabilitation plan which will include actions suitable to manage or prevent cumulative impacts to the geology and soils.	Refer to Section 6
C65	Erosion and sediment control measures will be developed as part of the CEMP for the Project.	Refer to Section 6 and Erosion Sediment Control Management Plan
C80	Careful consideration of site constraints and placement of towers and associated infrastructure to avoid/minimise direct disturbance to water features	Refer to Section 6
C81	Waterway crossings the Project traverses will be identified as waterway barrier works, and existing access tracks will be utilised wherever possible for access to the Project and when crossing waterways comply with DAF Accepted development requirements for operational work that is constructing or raising waterway barrier works.	Refer to Section 6
C83	Implement best practice erosion and sediment controls during construction.	Refer to Section 6 and Erosion Sediment Control Plan
C85	Locate permanent infrastructure away from flood prone areas where practicable or provide appropriate flood immunity in accordance with design requirements.	Refer to Section 6
C87	Transport, store, use and dispose potentially contaminating substances in accordance with manufactures specifications, legislative requirements and industry best practice	Refer to Section 6
C153(b)	As part of the Construction Environmental Management Plan, various sub-plans will be developed and implemented in relation to the environmental aspects for the Project: • Erosion and Sediment Control • Water Quality Management Plan, including stormwater controls and drainage measures	This plan Refer to Section 6 and Erosion Sediment Control Plan
HSE Specification for Contractors and Suppliers (CSPW-HSW-SPE-M8-000001, revision B) (HSE Specification)		
9.10 Soil and Water	The Contractor must ensure no adverse impacts on water bodies as a result of soil disturbing activities. Disturbed sites rehabilitated to stable condition.	This Plan
	a) All soil disturbance activities are to be managed in accordance with IECA Best Practice Erosion and Sediment Control Guidelines 2008. (i) A project Erosion and Sediment Control Plan (ESCP) must be developed for use prior to construction (ii) Upslope stormwater/runoff will be diverted, where possible (iii) Ground disturbance must be minimised and ground dover retained where possible, to reduce potential erosion surface area;	Refer to Section 6

Ref	Requirement	Where addressed
	(iv) Where soil disturbance has taken place, ensure appropriate erosion and sediment controls are in place. Visual assessments must be undertaken for the presence and effectiveness of control measures preceding significant rainfall events (within 24 hours of expected rainfall while the site is unstable, weekly inspections when rainfall is not expected or the site is stable). Records of monitoring will be available on site for inspection (v) Progressive rehabilitation of disturbed areas must be undertaken as soon as practicable to establish ground cover (minimum 70% or equivalent to existing ground cover)	
	b) Establish baseline water quality data (pH and turbidity as NTU), to be collected from receiving waters upstream and downstream of works. Where baseline data cannot be collected the following standards shall apply: (i) Turbidity less than 75 NTU (ii) pH 6.5 – 8.5 (iii) No visible debris or hydrocarbons.	Refer to Section 0
	c) Where practicable, existing access tracks will be used for the Project in preference to create new tracks, with upgrades or extensions conducted where necessary. Access tracks will be installed in accordance with Powerlink specifications.	Refer to Section 6
	d) Soil disturbance in erosion prone and steeply sloping areas must be minimised during clearing activities. Determine appropriate clearing methods for moderate to high erosion prone and steep areas so that the clearing methods minimise soil disturbance and potential for soil loss.	Refer to Section 6
	e) A dewatering method is to be prepared and implemented, taking into consideration site conditions and the water quality objectives of any receiving waters. At a minimum – dewatering of foundations or pits must be done through a filtration mechanism (i.e. sediment filtration device). Dewatering records are mandatory for sediment basin management. Records of dewatering of a sediment basin must contain the type and quantity of flocculating agent applied, pH of water immediately prior to release, turbidity (NTU) of water immediately prior to release, approximate volume of water released, location of release, date and time, and will be available on site for inspection.	Refer to Section 6 and Appendix A: Dewatering Management Plan
	f) Concrete washout pits are to be established on site for the washing of concrete tools and agitator truck chutes. This washout pit will be installed such that runoff from areas outside the pit is not allowed to enter the pit and contaminated water will not discharge from the pit in a rainfall event. Washout pit locations will be placed on the ESCP, communicated to concrete truck drivers and also be fenced used temporary bunting or covered when not in use to prevent access by the public and or domestic/native animals. The concrete washout pit will be removed at the completion of works.	Refer to Section 6
	g) Any excavation of placing of fill in a waterway shall be carried out in accordance with the Riverine Permit Exemption Requirements (WSS/2013/726) or as otherwise authorised under relevant legislation.	Refer to Section 6
	h) Any taking of water for the purpose of constructing or maintaining infrastructure must be carried out in accordance with the Exemption requirements for constructing authorities for the take of water without a water entitlement (OSW/2020/5467) or as otherwise authorised under a water entitlement.	Refer to Construction Water Management Plan

Ref	Requirement	Where addressed
	i) Records of sourced water shall be made available on site, for inspection.	Refer to Construction Water Management Plan
	j) The taking of state-owned resource (e.g. quarry material, forest product etc.) must be undertaken in accordance with a Resource Allocation Permit.	Refer to Section 6
	k) Any areas required for stockpiling must have topsoil stripped (~100 mm depth) prior to placement of any stockpile material to ensure suitable material is available for rehabilitation.	Refer to Rehabilitation Management Plan

3.2 Reference documents

This plan forms part of the CEMP which is a living document and will be updated as required where the scope of works is amended or when a subsequent risk has been identified. All changes will be agreed to by the project key stakeholders and updated by the environmental team. The following sub plan should be read in conjunction with the following regulatory submissions, granted approvals and project specific documents.

Table 3 Reference documents

Document title	Document ID / Relevant Sections
CopperString 2.0, Draft Environmental Impact Statement, Volume 2 Chapter 9, Water resources and water quality	All sections
CopperString 2.0, Draft Environmental Impact Statement, Volume 3 Appendix Q Framework and environmental management plan	Sections 3.1.9 and 4.5
CopperString 2.0, Supplement to the Draft Environmental Impact Statement, Volume 4	Section 4.6
CopperString Project, Coordinator – General's evaluation report on the environmental impact statement, September 2022	Section 5.3, Appendix 2 and Appendix 4
CopperString2032, Powerlink – HSE Specification for Contractors and Suppliers, version B	CSPW-HSW-SPE-M8-000001 Section 9
Construction Environmental Management Plan	9310-JV-PLN-CEM-0003
Regulatory Approvals Plan	9310-JV-PLN-RAP-0039
Erosion and Sediment Control Management Plan	9310-JV-PLN-ESC-0045
Rehabilitation Management Plan	9310-JV-PLN-REM-0049
Site Environmental Plan (template)	UGLMS-4-2138
Environmental Management Plan Template	UGLMS-4-2174, Version 4
Environmental Inspection Weekly Checklist (Form)	UGLMS-4-1549, Version 8
Environmental Monitoring Instructions (Knowledge)	UGLMS-5-1229 Version 2.0
Erosion and Sediment Control (Procedure)	EIMS-7-6204
Manage Soil and Water (Procedure)	MSID-2-308

4. Water Quality Management Plan

4.1 Management plan purpose

This Water Quality Management Plan addresses the management of potential impacts to water quality that may be caused by Project activities and that have the potential to adversely affect the environment and community. It includes the **Dewatering Management Plan in Appendix A.**

Activities conducted on the project that have the potential to impact water quality are provided below.

Table 4 Hazards and impacts – water quality

Project Hazard	Potential Environmental Impact
Clearing and grubbing	Increased sediment load in run off impacting aquatic fauna and flora
Cutting and filling	Erosion associated with bulk earthworks resulting in sedimentation and negative impacts to water quality
Waterway crossings	Implementation of waterway crossings resulting in additional erosion and sedimentation
Spills of fuel/hydraulic fluids	Negative impacts to soil and water quality through introduction of hydrocarbons and other contaminants
Excavation	Impacts to aquatic fauna and flora through increased turbidity
Concreting	Water quality negatively impacted though increase in pH and sedimentation
Storage and use of flammable and combustible liquids and solids	Water quality negatively impacted through introduction of hydrocarbons and other contaminants
Discharge from workforce accommodation facilities	Negative impacts to soil and water quality from sewage treatment plant
Run off from workshops and plant washdown bays	Negative impacts to soil and water quality through introduction of hydrocarbons and other contaminants
Runoff from hardstand areas, eg laydown	Water quality negatively impacted through increased turbidity

4.2 Management plan objectives

- Minimise or avoid impacts to receiving water quality in waterways, wetlands and surface water storages
- No adverse impacts to surface water storages or downstream surface water users
- No adverse impacts on groundwater quality
- Maintain water quality at existing levels
- Ecological and cultural significance of springs are protected.

4.3 Performance / target criteria

- No detrimental impact to surface or groundwater users
- Compliance with any permit conditions for surface or groundwater use or discharge of treated effluent.

5. Existing Environment

The CopperString project crosses several large catchment areas in central and northern Queensland including (refer to Figure 3):

- Haughton River
- Burdekin River
- Cooper Creek Bulloo River
- Flinders-Norman Rivers
- Nicholson-Leichardt River.

Of these river systems, the Burdekin River is the largest (based on streamflow volume) with mean annual flow volumes of 4,400 GL/yr recorded at Sellheim. The next largest river system is Flinders River with a mean annual flow of 520 GL/yr recorded at Richmond. All other watercourses have mean annual flow volumes less than 250 GL/yr. Many of the major water features crossing the project corridor are also non-perennial in nature, with flows only experienced during the wet season (about four to five months of the year). For the remaining seven to eight months of the year, these are virtually dry, with the rivers reduced to a few scarce and vulnerable waterholes during this dry season.

The Department of Environment and Science (DES) define environmental values as aquatic and human uses of the water body and water quality objectives as objectives for water characteristics (physical, chemical and biological). Environmental values and water quality objectives for the Haughton River and Burdekin River within the project corridor are outlined within the following:

- Haughton River Basin Environmental Values and Water Quality Objectives (DES, June 2022)
- Burdekin River (upper) Sub- Basins Environmental Values and Water Quality Objectives (DES, June 2022)

No other environmental values or water quality objectives have been finalised or scheduled for the other catchments. In these areas the Queensland Water Quality Guidelines and Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018), with reference to the Queensland Government Water Monitoring Information Portal, are applied as default guidelines.

The majority of the project lies within Great Artesian Basin area, with the water plan area of the Water Plan (Great Artesian Basin and Other Regional Aquifers) 2017 applying.

The most significant groundwater reserve within the Project area is the Great Artesian Basin (GAB). The western areas of the GAB (i.e. from Cloncurry to Mount Isa) and the western diverging sections are subartesian groundwater resources. Groundwater resources are consequently an important resource for pastoral, domestic and small municipal requirements.

Water plans are developed by the State under the *Water Act 2000* to sustainably manage and allocate water resources in Queensland, with the following water plans in place along the corridor (refer to Figure 4):

- Water Plan (Burdekin Basin) 2007
- Water Plan (Cooper Creek) 2011
- Water Plan (Gulf) 2007
- Water Plan (Great Artesian Basin and Other Regional Aquifers) 2017.

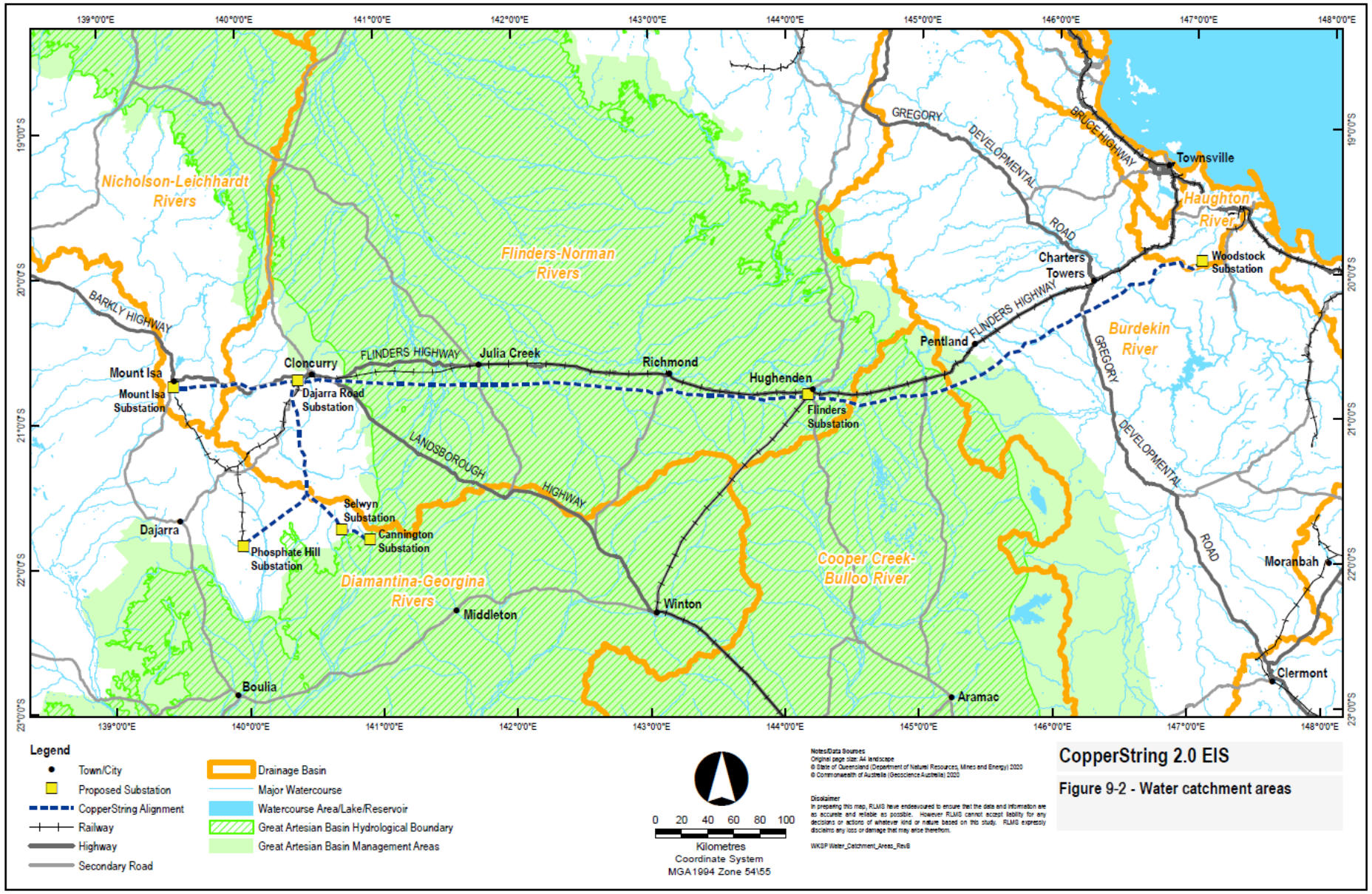

Figure 3: Surface water catchment areas across the project corridor (Source: CopperString 2.0, Draft Environmental Impact Statement, Volume 2, Figure 9-2)

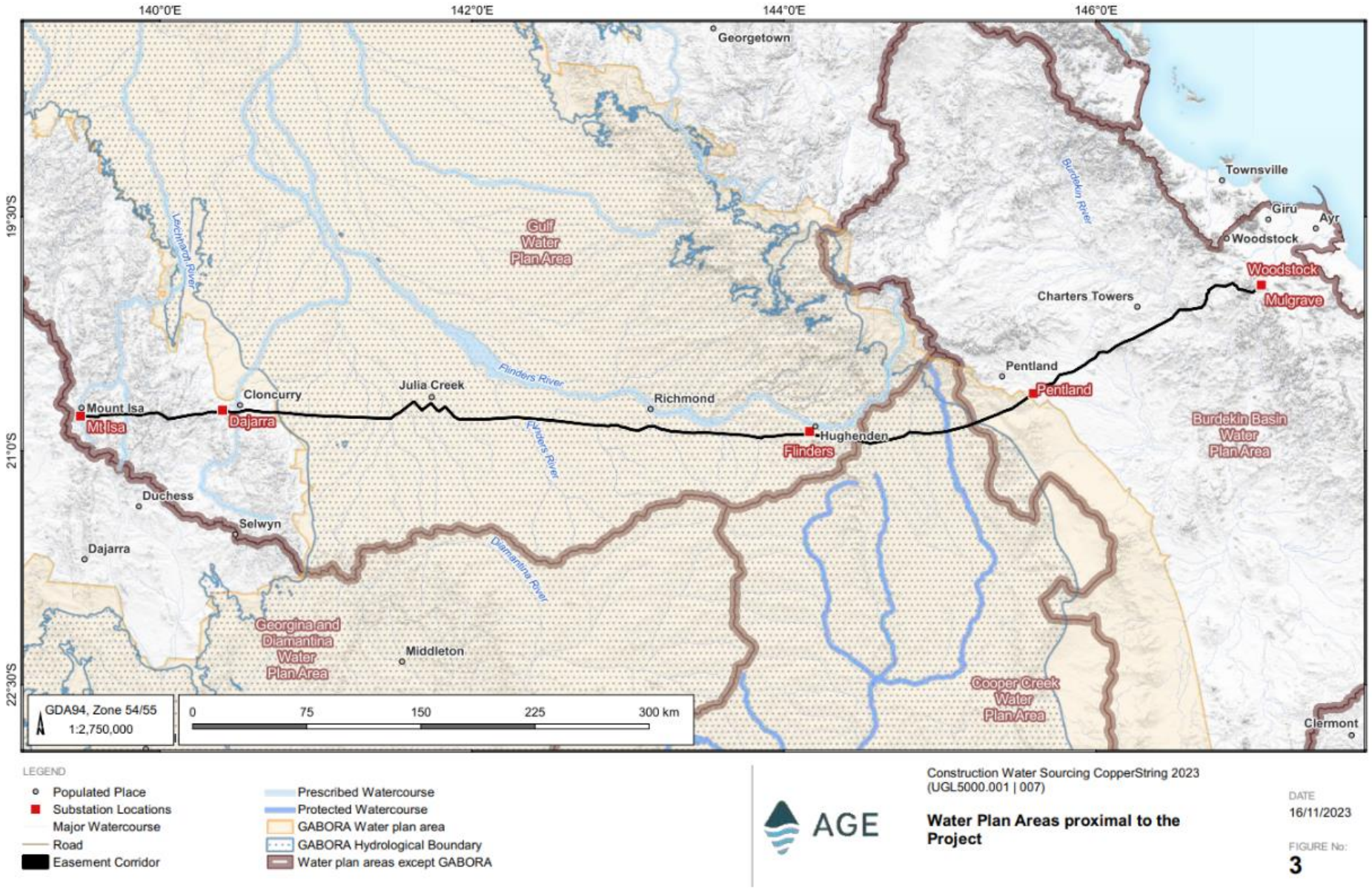

Figure 4: Water plan areas along the project corridor

6. Controls Used to Manage Water Quality

Controls that are adequate to minimise water use and potential water quality impacts, to ensure compliance, and to reduce risk are implemented before any relevant works commence. Elimination of the hazard is the first preference of control, followed by engineering, then administrative controls. Typical controls used on this project include:

Table 5 Water quality controls

Ref	Control	Accountability	Source
Pre-construction and design			
WQ1	Ensure all soil and water risks are considered as part of the development of Construction Area Plans and Work Packs.	Project Engineers	Best Practice
WQ2	During detailed design transmission towers and associated infrastructure will be placed to avoid or minimise direct disturbance of water features.	Design Manager	Commitment C80
WQ3	During detailed design permanent infrastructure will be located away from flood prone areas where practicable or appropriate flood immunity will be provided in accordance with the Principle's Project Requirements, including SDC-001 Substation Civil and Structural Design Specification and Criteria File Developments for Greenfield and Brownfield Applications and Managing Risk with Overhead Transmission Lines during Floods – Plan.	Design Manager	Commitment C85
WQ4	An Erosion and Sediment Control Management Plan will be prepared which outlines the project's erosion and sedimentation management strategy and introduced controls and measures for implementation across the project corridor.	Project Environmental Representative	Commitment C153b
WQ5	Erosion and Sediment Control Plans (ESCP) will be developed by a suitably qualified person (e.g. Certified Professional in Erosion and Sediment Control (CPESC) or other demonstrated experience) in consultation with the construction team. They will be approved by the Project Environmental Representative and Site Supervisor and included in relevant work packs.	Project Environmental Representative	Commitment C17 Commitment C65 Manage Soil and Water (CPBEMS)
WQ6	ESCPs will be developed to address the wet weather aspects associated with the use of unsealed access tracks, prior to construction. These plans will include measures to avoid, manage or mitigate potential risk to soils, including specific reference to management / mitigation of risks associated with salinity, specifically providing evidence of no clearing in salinity expression areas.	Project Environmental Representative	Commitment C50
Construction – Erosion and Sediment Controls			
WQ7	Erosion and Sediment Controls (ESC) shall be designed (stability, location, type and size), constructed, operated and maintained in accordance with the approved drawings, ESCP or Site Environment Plan and relevant, local guidelines, including: • Best Practice Erosion and Sediment Control (International Erosion Control Association, November 2008) • Queensland's Construction Phase – Stormwater Management Design Objectives (Department of Infrastructure, Local Government and Planning, July 2017).	Construction Manager Site Supervisor	Recommended Requirement B28 Recommended Requirement B33a(i) Commitment C83

Ref	Control	Accountability	Source
WQ8	ESC will be installed prior to (or immediately upon) any disturbance to vegetation or soil. These controls will remain in place until revegetation, stabilisation or hard scaping has occurred. If these controls require maintenance notify your supervisor.	Site Supervisor All	Manage Soil and Water (CPBEMS)
WQ9	In accordance with standard construction practices weather forecasts shall be used to guide work activities undertaken on-site. Forecasts shall be checked at the start of each day and prior to undertaking new work activities that may be affected by rainfall or adverse weather. Where weather forecasts predict conditions that may pose an environmental risk, site environmental controls shall be inspected and secured to reduce erosion and sediment control impacts.	Site Supervisor	Best Practice
WQ10	So far as reasonably practical cleared areas will be kept to a minimum and will be progressively rehabilitated/revegetated as they become available in accordance with the Rehabilitation Management Plan.	Construction Manager	Erosion and Sediment Control (UGLEMS) Manage Soil and Water (CPBEMS)
WQ11	Soil disturbance in erosion prone and steeply sloping areas will be minimised during clearing. Clearing will incorporate: • Early establishment of clean water diversions, • Progressive clearing and rehabilitation • Minimisation of slope length where possible and • Minimisation of disturbance (maximisation of groundcover until necessary for construction.	Construction Manager	HSE Specification
WQ12	Clean water diversions will be installed prior to the commencement of work.	Site Supervisor	Commitment C17 Erosion and Sediment Control (UGLEMS) Manage Soil and Water (CPBEMS)
WQ13	Sediment laden water (dirty water) captured onsite will be preferentially reused e.g. dust control, in accordance with the Dewatering Management Plan.	Site Supervisor	Manage Soil and Water (CPBEMS)
WQ14	No stockpiles will be located within 50 m of watercourses. Stockpiles will be protected from overland flow and covered or stabilised to minimise wind and water erosion	Site Supervisor	Erosion and Sediment Control (UGLEMS) Manage Soil and Water (CPBEMS)
WQ15	Access tracks will be managed in accordance with the erosion and sediment control plan for the area of works to minimise erosion and measures implemented will be regularly maintained.	Site Supervisor	Erosion and Sediment Control (UGLEMS)
WQ16	Shaker grids will installed at entry/exit points, where required	Site Supervisor	Erosion and Sediment

Ref	Control	Accountability	Source
			Control (UGLEMS)
WQ17	If dispersible soils are disturbed, sediment basins may be required to capture and treat sediments in accordance with the ESCP. Basin design and treatment options to be determined by an appropriately trained professional	Site Supervisor	Erosion and Sediment Control (UGLEMS)
WQ18	Water transfers / movement around site and discharged from site will be undertaken in accordance with the project's Dewatering Management Plan (refer to Appendix A).	Construction Manager	Recommended Requirement B33a(v) Manage Soil and Water (CPBEMS)
Construction – Waterway crossings			
WQ19	Where a waterway must be traversed existing access tracks will be utilised, wherever possible, or alternatively the crossing will comply with either: • Accepted development requirements for operational work that is constructing or raising waterway barrier works (Department of Agriculture and Fisheries, 2018), or • An Operational Works: Waterway Barrier Works approval, and • Riverine Permit Exemption Requirements (WSS/2013/726), or • Authorisation under relevant legislation including the *Fisheries Act 1994*.	Project Environmental Representative	Commitment C81
WQ20	Detailed crossing plans will be developed for waterway crossings prior to construction with significant environmental features identified.	Project Environmental Representative	Best Practice
WQ21	Erosion and sediment control measures will be implemented at creek crossings.	Site Supervisor	Best Practice
WQ22	Cut and fill construction near waterbodies is to be avoided, where feasible and reasonable, or minimised.	Site Supervisor	Best Practice
WQ23	Rehabilitation of creeks will occur as soon as reasonably practicable after completion of the crossing. Natural drainage patterns will be restored following construction, as far as reasonably practicable.	Site Supervisor	Best Practice
Construction – Flooding			
WQ24	• Temporary infrastructure that is prone to damage from inundation or may act as a source of contamination will be provided with the required flood immunity, with workforce accommodation facilities designed to be immune from 1% AEP flood events. .	Construction Manager	Best Practice
Construction – Contamination			
WQ25	Concrete washout facilities will be provided where concrete pours will occur and these facilities will be maintained. The washout facilities will be isolated from surface water flows using bunds to prevent contamination of clean surface waters and will be lined to prevent contamination of soil and ground water Washout facility locations will be placed on the ESCP, communicated to concrete truck drivers and also be fenced used temporary bunting or covered when not in use to prevent access by the public and or domestic/native animals. The concrete washout pit will be removed at the completion of works.	Site Supervisor	Best Practice

Ref	Control	Accountability	Source
WQ26	All potentially contaminating substances (liquids and solids), including hazardous substances, are transported, stored and managed according to manufacturer's specifications, legislative requirements, relevant standards and industry best practice.	Site Supervisor	Commitment C87
WQ27	All refuelling points, including refuelling/lube trucks, will have hydrocarbon spill kits.	Site Supervisor	Best Practice
WQ28	Contingency planning to prevent spills shall involve monitoring for predicted flood events and the removal of plant, equipment, fuels and chemicals from flood prone areas.	Site Supervisor	Best Practice
Construction – General			
WQ29	Fertilisers and pesticides used for revegetation activities will be applied during favourable weather conditions to prevent spray drift (i.e. no high winds or runoff) and at the minimum required amount.	Site Supervisor	Best Practice
WQ30	Construction site housekeeping will be adequate to prevent litter entering waterways including the provision of waste bins, regular site inspections and staff training in waste disposal procedures.	Site Supervisor	Best Practice
WQ31	Compound wastewater will be disposed of in accordance with the project's Dewatering Management Plan (refer to Appendix A).	Site Supervisor	Best Practice
WQ32	Any excavation of placing of fill in a waterway shall be carried out in accordance with the Riverine Permit Exemption Requirements (WSS/2013/726) or as otherwise authorised under relevant legislation including the *Water Act 2000*.	Project Environmental Representative	HSE Specification
WQ33	The taking of state-owned resource (e.g. quarry material, forest product etc.) must be undertaken in accordance with a Resource Allocation Permit.	Project Environmental Representative	HSE Specification

7. Monitoring Water Quality

7.1 Water quality monitoring

Water quality monitoring will be performed across the project where there is a risk of impact from the construction works on the project. This monitoring will be completed in accordance with legal and contract requirements. The project requirements for water quality monitoring are detailed in Table 6 below.

The results obtained from routine sampling and event based sampling will be compared against criteria in Table 7, which is based on monitoring data available on the Queensland Government Water Monitoring Information Portal. It is noted that the values presented in Table 7 often exceed the default trigger values for upland rivers in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018).

Where criteria are not provided in Table 7 the results obtained from routine sampling and event based sampling will be compared against:

- Turbidity less than 75 NTU
- pH 6.5 – 8.5
- No visible debris or hydrocarbons.

Discharge sampling results will be compared against the water quality criteria in the Dewatering Management Plan, Section 4.2.

The comparison of monitoring data from routine sampling and event based sampling against the water quality criteria provides an indication of potential change in water quality. Where monitoring determines non-compliance to be a risk or to have occurred, an incident report and corrective actions are raised in Synergy. A non-compliance is considered to have occurred for routine sampling and event based sampling:

- Step 1: Where any of the following occur:
  - A parameter exceeds the criteria for any single monitoring event by more than 30%
  - A parameter downstream exceeds the corresponding parameter upstream for any single monitoring event by more than 20%
  - A parameter exceeds the criteria for two consecutive monthly monitoring events, or
  - A parameter exceeds the criteria for half of the sampling events in a twelve-month period, AND
- Step 2: In the event that any of the above triggers are observed, a review will be initiated immediately to determine the significance of the exceedance(s) and possible causes. The review will assess the data in Table 7 for the relevant waterway, recent rainfall records, other activities within the catchment and recent activities or recorded erosion/sediment control incidents occurring in the catchment.

  If the exceedance is determined to be attributable to Project works, the event will be treated as a non-compliance and managed in accordance with the requirements of Section 8.4 of the CEMP. Corrective and preventative actions will be identified and implemented as part of that process.

Monitoring and analysis of data will be carried out by a competent person. Evidence of competence will be retained.

It is the accountability of the Project Environmental Representative to ensure all monitoring is performed according to these requirements.

Table 6 Water quality monitoring program

Type	Location	Parameters	Methodology	Frequency
Routine sampling, where project works are being undertaken within the catchment of the waterway	Locations in Table 7 Upstream and downstream of project works if access permits	Turbidity pH Dissolved Oxygen Conductivity	Field and lab sampling	Monthly [A]

Type	Location	Parameters	Methodology	Frequency
	OR Next downstream crossing of the water (within 10km of the project)	Temperature Visible debris Visible hydrocarbons		
Event based sampling, where 31mm [B] or more of rain is received within 24 hours and project works are being undertaken within the catchment of the waterway	Locations in Table 7 Upstream and downstream of project works if access permits [C] OR Next downstream crossing of the water (within 10km of the project) [C]	Turbidity pH Dissolved Oxygen Conductivity Temperature Visible debris Visible hydrocarbons	Field and lab sampling	Within 24 hours following the rain event
Discharge sampling	Point of discharge within receiving waterway	Turbidity pH Dissolved Oxygen Visible debris Visible hydrocarbons	Field sampling	Prior to and following discharge (refer to Dewatering Management Plan for further detail)

Notes:
[A] Most of the waterways traversed by the project are ephemeral, remaining dry for most of the year and only filling after periods of prolonged or heavy rainfall; monthly monitoring will proceed when water is flowing within the waterway
[B] 85th percentile IECA rainfall event average for Charters Towers, Mt Isa and May Kathleen
[C] Due to the locality of the project alignment, some monitoring points are inaccessible and unable to be utilised during wet periods

Table 7 Water quality monitoring locations and performance criteria (Source: Queensland Government Water Monitoring Information Portal)

Station	Location	Performance Criteria					
		pH	EC (µS/cm)	DO (mg/L)	Turbidity (NTU)	TDS (mg/L)	Total N (mg/L)
915203C	Cloncurry River	-	-	-	-	-	-
915211A	Williams River	7.43	156.4	-	94.3	98.3	-
915208A	Julia Creek	7.60	302.7	6.1	930.6	165.6	-
120307A	Cape River	7.66	165.5	7.0	130.1	105.4	-
120002C	Burdekin River	8.14	301.7	8.0	89.7	173.4	0.36

Note: - indicates not reported or less than 10 data counts

7.2 Meteorological monitoring

Meteorological data from the stations in Table 8 will be monitored during construction to:

- Identify potential upcoming significant rain events to ensure all pre-rainfall controls are in place, e.g. stabilisation of exposed areas, clean water diversions, removal of construction equipment from potential flood areas
- Identify potential upcoming high wind events to plan controls required under the Air Quality Management Plan
- Confirm when event based sampling is required (refer to Table 5)

- Assess compliance and identify potential non-compliances is collected.

Table 8 Water quality monitoring locations

Station	Location	Source	Frequency
029127	Mount Isa	http://www.bom.gov.au/products/IDQ60801/IDQ60801.94332.shtml	Daily
029141	Cloncurry	http://www.bom.gov.au/products/IDQ60801/IDQ60801.94335.shtml	Daily
029058	Julia Creek	http://www.bom.gov.au/products/IDQ60801/IDQ60801.94337.shtml	Daily
030161	Richmond	http://www.bom.gov.au/products/IDQ60801/IDQ60801.94341.shtml	Daily
030022	Hughenden	http://www.bom.gov.au/products/IDQ60801/IDQ60801.94343.shtml	Daily
034084	Charters Towers	http://www.bom.gov.au/products/IDQ60801/IDQ60801.94356.shtml	Daily

7.3 Inspections

Regular inspections will be undertaken and include:

- Weekly inspections by the Environment team of active, exposed work sites to evaluate the effectiveness of erosion and sediment controls measures
- Rainfall inspections will be conducted prior to a forecast of >31 mm over a 24 hour period at active exposed work sites to assess site preparedness for upcoming predicted rainfall event
- Rainfall inspections will be conducted after rainfall events that generate runoff from site, to evaluate the effectiveness of erosion and sediment controls measures
- Inspections will be undertaken of erosion and sediment controls prior to any shut down greater than 48 hours.

8. Reporting

During construction, surface water quality data will be collected, tabulated and assessed against the performance criteria in Table 6.

Environmental records to be kept on site and made available to Powerlink Queensland or external auditors upon request. This file will contain the following:

- Completed environmental checklists/reports during the construction phase
- Reports of any environmental incidents or non-conformances with the CEMP
- Internal and external environmental audit results.

9. Plan Review and Control

This plan shall be reviewed on a regular basis but not greater than 12 monthly intervals in accordance with the requirements specified in the:

- The JV Quality Management System
- CEMP
- CopperString 2032, Powerlink – HSE Specification for Contractors and Suppliers, version B.

All the Project environmental management documents, review (version history) will be uploaded and maintained on InEight or the UGLCPBJV's Document Management System.

10. References

- Accepted development requirements for operational work that is constructing or raising waterway barrier works (Department of Agriculture and Fisheries, 2018)
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG,2018)
- Best Practice Erosion and Sediment Control (International Erosion Control Association, November 2008)
- CopperString 2.0 Environmental Impact Statement (2019)
- CopperString 2.0 Supplement to the Draft Environmental Impact Statement (2022)
- CopperString Project - Coordinator-General's evaluation report on the environmental impact statement (Coordinator General, September 2022)
- CopperString 2032, Powerlink – HSE Specification for Contractors and Suppliers (CSPW-HSW-SPE-M8-000001, version B)
- Monitoring and Sampling Manual: Environmental Protection (Water) Policy 2009 (Department of Environment and Science, 2018)
- Queensland's Construction Phase - Stormwater Management Design Objectives (Department of Infrastructure, Local Government and Planning, July 2017).
- Queensland Government Water Monitoring Information Portal (https://water-monitoring.information.qld.gov.au/)
- Queensland Water Quality Guidelines 2009 (Department of Environment and Heritage Protection, 2009)
- Riverine Permit Exemption Requirements (WSS/2013/726) (Department of Regional Development, Manufacturing and Water, 2023)

Appendix A Dewatering Management Plan

Scope

This Dewatering Management Plan is an appendix to the Water Quality Management Plan. It is applicable to all activities conducted by site personnel (including sub-contractors) that have the potential to require transfer, movement or dewatering on-site during construction of the project.

Project Environmental Management Obligations

Construction of the project must comply with environmental legislation and guidelines, and any additional requirements specified in approval conditions.

Species legislative and other requirements relevant to this plan are detailed below.

Commonwealth legislation

Commonwealth legislation that is relevant to the project and this plan includes:

- *Environment Protection and Biodiversity Conservation Act 1999.*

State legislation

State legislation that is relevant to the project and this plan includes:

- *Environmental Protection Act 1994*
- *Environmental Protection (Water and Biodiversity) Policy 2019*
- *Coastal protection and Management Act 1995.*

Standards and guidelines

Standards and guidelines that are relevant to the project and this plan include:

- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018)
- Queensland Water Quality Guidelines 2009 (DEHP, 2009)
- Monitoring and Sampling Manual: Environmental Protection (Water) Policy 2009 (DES, 2018)

Conditions of approval – Requirements and commitments schedule

Table 9 summarises the water quality requirements and commitments that are relevant to the project and notes where they have been addressed in this plan

Table 9 Environmental requirements and obligations relevant to this plan

Ref	Requirement	Where addressed
Coordinator General's Report, Appendix 2 Part B		
B33(a)	Prior to the commencement of works, prepare and submit a Construction Environmental Management Plan (CEMP) to DSDILGP (infrastructuredesignation@dsdlgip.qld.gov.au). The CEMP must be consistent with management measures detailed in the project EIS and, and must include/address the following:	This plan

Ref	Requirement	Where addressed
B33(a)(v)	a dewatering management plan that establishes suitable protocols to treat or remove water from the site, should it be required during construction	This plan

Existing Environment

The CopperString project crosses several large catchment areas in central and northern Queensland including (refer to Figure 5):

- Haughton River
- Burdekin River
- Cooper Creek
- Flinders River
- Leichardt River.

Of these river systems, the Burdekin River is the largest (based on streamflow volume) with mean annual flow volumes of 4,400 GL/yr recorded at Sellheim. The next largest river system is Flinders River with a mean annual flow of 520 GL/yr recorded at Richmond. All other watercourses have mean annual flow volumes less than 250 GL/yr.

Many of the major water features crossing the project corridor are also non-perennial in nature, with flows only experienced during the wet season (about four to five months of the year). For the remaining seven to eight months of the year, these are virtually dry, with the rivers reduced to a few scarce and vulnerable waterholes during this dry season.

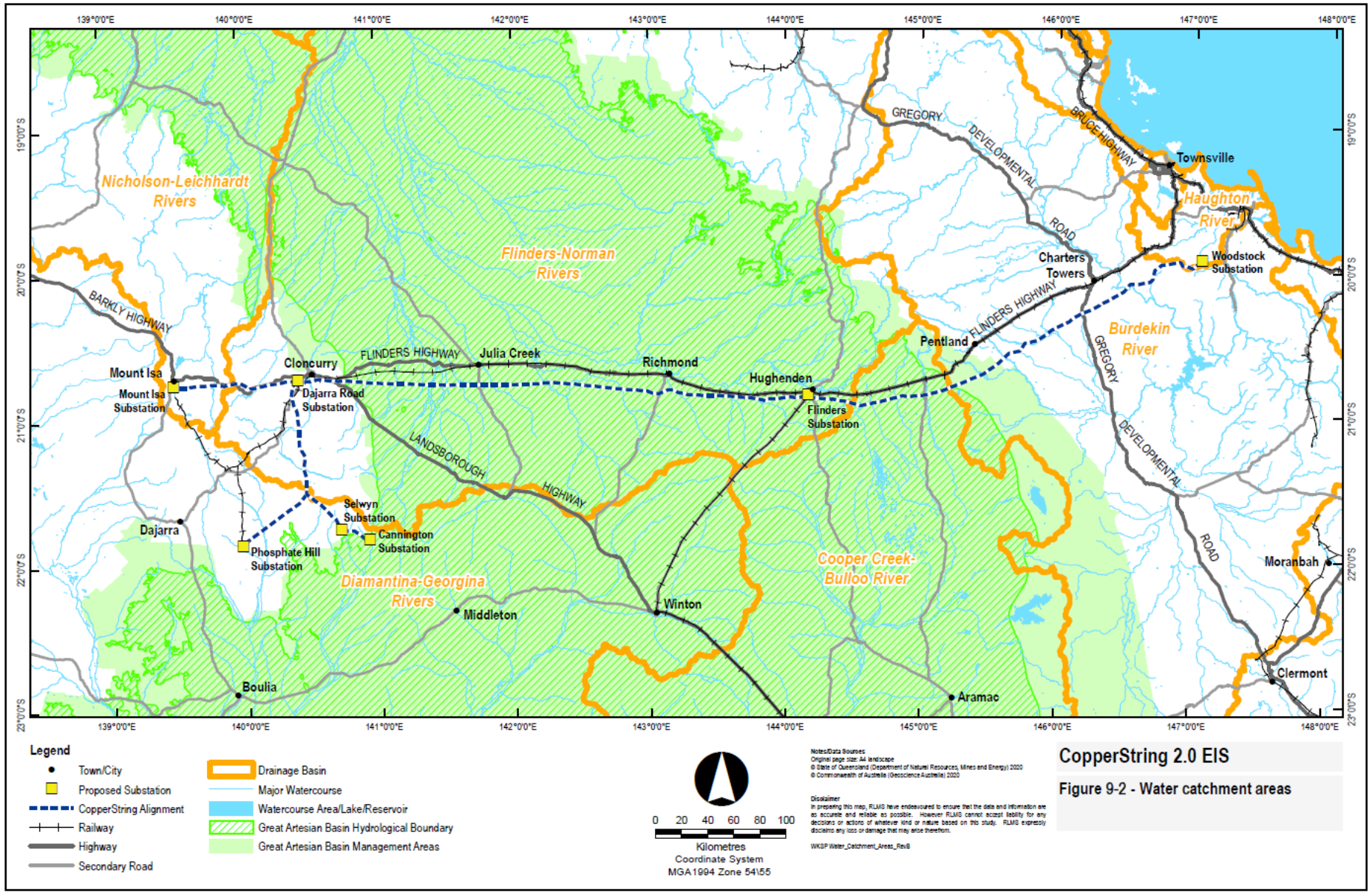

Figure 5 Surface water catchment areas across the project corridor

Dewatering procedure

Approach

The approach to dewatering will generally follow the below hierarchy:

- Investigate any opportunities for onsite reuse. This may include applications such as dust suppression, earthworks compaction, vegetation establishment/rehabilitation, and plant/vehicle wash-down
- Investigate any opportunities of discharging water to land to allow the water to infiltrate into the ground, thus avoiding direct discharge to, or pollution of, waters. This approach will be considerate of adjacent land uses, sensitive receptors and water quality restrictions (refer to Section Water quality criteria below)
- Discharge offsite. Onsite reuse or land discharge may be limited by climatic or site conditions (i.e. saturated ground) and water may need to be discharged to meet the sediment basins requirements (i.e. reinstating capacity) identified in the Erosion and Sediment Control Plan (ESCP)
- If groundwater inflows are observed from the cuts, the groundwater quality from the cut is to be sampled to determine representative water quality. Any groundwater emanating from cuts will flow in surface drains to downslope construction sediment basins. It will be tested prior to discharge in accordance with this procedure.

This procedure does not apply to the reuse of treated effluent from sewage treatment plants.

Water quality criteria

Water reuse

On-site reuse will be deemed permissible only if:

- There is no visible oil or grease
- No erosion is caused from the discharge
- Any runoff generated by the reuse is controlled entirely within the site boundary and appropriate sediment controls are installed and maintained in accordance with the ESCP
- pH levels are between 6.5 – 8.5.

If all criteria above are met, then the water may be authorised for reuse by the Project Environmental Representative (or delegate).

If the criteria are not met, treatment of water will occur in accordance with the Water Treatment section. Where water requiring discharge is associated with a contaminated site (refer to Contaminated Land Assessment Report) treatment and disposal will be in accordance with measures specific to the contamination present and a site management plan (if required by the *Environmental Protection Act 1994*).

Discharge to land

Discharge to land within the site boundary will only occur if:

- There is no visible oil or grease
- No surface runoff will be generated from the discharge, additionally that there is no potential for discharged water to reach any watercourse (within or outside the site)
- No erosion is caused from the discharge and appropriate erosion and sediment control are installed in accordance with the ESCP
- Under a water discharge permit approved by Project Environmental Representative (or delegate).

In addition to the above, discharges to land:

- Over landscaped areas will only occur if pH levels are between 6.5 – 8.5

- Outside the lease boundary will only occur if consultation has been undertaken with the landowner. Otherwise, all discharge water must be wholly contained within the site boundary.

If water is going to be re-used on site for dust suppression or construction purposes and will drain back into sediment capture measures no treatment is required except pH which must be 6.5-8.5 and no visible oil/grease).

Where water requiring discharge is associated with a contaminated site (refer to Contaminated Land Assessment Report) treatment and disposal will be in accordance with measures specific to the contamination present and a site management plan (if required by the *Environmental Protection Act 1994*).

If the criteria are not met, treatment of water will occur in accordance with Section Water treatment.

Discharge to waters

The concentration of a pollutant discharged offsite to a waterway, or applied to that area, must not exceed the concentration limits specified for that pollutant in Table 10.

Water quality testing will be undertaken less than 24 hours prior to a controlled discharge and daily for any continued controlled discharge or when rainfall causes runoff to the source of water under controlled discharge (where access is available). Before any water can be discharged offsite, it must meet the water quality parameter limits for discharges of pollutants to water set out in Table 10. If the criteria are met, the water is suitable for discharge. If the criteria are not met, treatment of water will occur in accordance with the Water Treatment Section.

Table 10 Discharge water quality criteria

Parameter	Unit of measurement	Concentration Limit (100 percentile)
Oil and grease	Visible	Not visible
pH	pH Units	6.5 - 8.5
Turbidity	NTU	75

Exceeding the limits specified in Table 10 for licensed discharge points is only permitted when:

- The discharge occurs solely as a result of rainfall measured at the site exceeding the design 5-day rainfall depth value (31 mm)
- The sediment basins and other erosion and sediment controls corresponding to the discharge point(s) have been designed, constructed, operated and maintained in accordance in accordance with the ESCP.

Water treatment

An environmental work method statement (EWMS) will be developed to identify the methods for treating water if the water does not meet the discharge criteria. This will include measures for treatment of pH, a flocculation procedure to manage turbidity, and methods to remove petroleum hydrocarbons, metals or other pollutants.

Where flocculation is necessary to settle suspended sediments in the basins, the proposed flocculant or coagulant will be applied as the flocculating agent to settle the sediments within 24 hours of the conclusion of each rain event causing runoff. An appropriate amount of flocculating agent, suitable for the volume to be treated, the sediment type and the rainfall event conditions will be calculated.

The Project Environmental Representative (or delegate) will ensure that flocculants and other water treatment chemicals are appropriately stored on site. Bulk flocculants will be covered and positioned within erosion and sediment controls away from areas with the potential for water runoff. All treatment chemicals

will be stored in appropriately bunded and covered locations that are locked to prevent unauthorised access. Requirements of the Safety Data Sheets will be followed.

pH

Method for treating water if the water does not meet the discharge criteria for pH:

1. Test water with appropriately calibrated pH meter
2. No action if pH reading between 6.5 and 8.5
3. Lime to be added if pH below 6.5
4. Sodium bisulphate to be added if pH above 8.5
5. Determine volume of water in basin or excavation
6. Bucket Test. Determine percentage of lime or acid required by taking a 10 litre sample of basin or excavation water and adding a known amount of lime or acid (initially 0.004%). If the pH is still not acceptable, vary the amount of lime or acid until within the limits
7. Once the required percentage has been determined, calculate the actual amount of lime or acid to be added by multiplying the volume of water in the basin or excavation by the determined percentage
8. Add the required amount of lime or acid to the basin or excavation
9. Mix the water in the sediment basin or excavation by pumping water to recirculate
10. Treat for pH prior to NTU.

Note: Refer to SDS for Hydraulic or Sulfuric Acid (note alternative products may be used) prior to handling. The following PPE must be worn at all times when handling Hydrochloric or Sulfuric Acid:

- Safety glasses with side shields, chemical goggles or full-face shields.
- Impervious PVC or butyl rubber gloves.
- PVC overalls/jacket/apron and butyl rubber Wellington boots.
- If handling indoors, approved respirator with replaceable vapour/mist filter.

Note: Refer to SDS for Lime prior to handling. The following PPE must be worn at all times when handling Lime:

- Safety glasses.
- If handling indoors, approved P2 face mask.

Turbidity (NTU)

Method for treating water if the water does not meet the discharge criteria for Turbidity (NTU) (Note: this method is not applicable to water discharged to land, eg for irrigation):

1. Collect a sample of basin or excavation water using a laboratory supplied container (an appropriately calibrated water quality probe will be used to measure the NTU level)
2. If the NTU result is below nominated criteria dewatering can commence. If NTU is above nominated criteria, the water should be treated with a flocculent
3. If basin or excavation require flocculation, alum (Aluminium Sulphate) or alternative flocculant within 24 hours of the conclusion of each rain event causing runoff
4. Methods of application to include:
    a. Load the empty IBC with 100 Litres of pure liquid Alum. Fill the rest of the tank up with construction water.
    b. Apply the diluted alum mix at a rate of 1 Litre per cubic meter in the basin (e.g. 1000 Litres would treat a 1000 m3 basin).
    c. Adjust the nozzle and direct the hose so that the dilution can be sprayed over the whole extent of the basin, try and achieve an even application of the basin surface.
    Note: Alum will reduce the pH of the water (making it acidic); the pH of all discharge waters must be between 6.5 and 8.5 (refer to above section Water Treatment, pH for method to treat pH).
    Leave the basin for at least 1 hour before going onto step 4.

   d. The solution must be mixed before use to ensure the product is evenly suspended throughout mixture. To be applied as per manufacturer instructions
5. Basins or excavations should be monitored and recorded daily after flocculation until desired turbidity is achieved and to assist in determination of optimal dosage levels. Allow up to 36 – 48 hours for flocculation to occur.

Note: Refer to SDS for alum prior to handling. The following PPE must be worn at all times when handling alum:

- Safety glasses with side shields, chemical goggles
- Do not use alum indoors – only outdoors in a well ventilated area.

Oil and grease

Method for treating water if the water does not meet the discharge criteria for oil and grease.

1. Examine surface of water for evidence (e.g. sheen, discoloration)
2. No action if no visual contamination
3. Oil absorbent material to be removed if there is contamination with absorbent materials (e.g. Xtrasorb, floating booms, pads and socks) and/or an oil/water separator. This task can be undertaken concurrently as flocculation occurs.
4. Leave basins to compensate for 24 to 48 hours.

Discharging water

Testing

All water must meet the water quality parameter limits for discharges of pollutants to water set out in the Water Treatment Section, prior to being discharged. If the criteria are met, the water is suitable for discharge. If the criteria are not met, treatment of water will occur in accordance with the Water Treatment Section.

Water quality testing will be conducted in accordance with:

- Australian Standard 5667:1998 Water Quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples (AS/NZS 5667.1:1998)
- Australian Standard 5667:1998 Water Quality – Sampling, Part 6: Guidance on sampling of rivers and streams (AS/NZS 5667.6:1998)
- Monitoring and Sampling Manual: Environmental Protection (Water) Policy 2009 (DES, 2018).

In situ water quality parameters will be recorded and grab samples collected for laboratory analysis (as required). Water quality testing will be undertaken less than 24 hours prior to a controlled discharge and daily for any continued controlled discharge or when rainfall causes runoff to the source of water under control discharge.

Discharge, inspection and monitoring

Water discharge will only occur following approval by the Project Environmental Representative (or delegate) who will issue a Permit to Discharge.

Prior to the commencement of dewatering, the Project Environmental Representative (or delegate) will inspect the entire system, including intakes and outlets, pumping and discharge locations.

The dewatering activities will be directly supervised by personnel trained in this Plan and the EWMS.

If the Project Environmental Representative (or delegate) is not available to directly supervise dewatering, supervision by a site representative (e.g. labourer, leading hand) will be carried out and mitigation measures implemented to eliminate the risks of pollution and to prevent the occurrence of the following:

- Intake suction placed within the deposited sediments resulting in discharge of sediment laden waters
- Erosion at discharge locations and downstream areas
- Inadvertent or intentional controlled discharge of untreated waters
- If native fish become stranded as a result of dewatering activities, they are to be relocated by a qualified aquatic ecologist where feasible.

Dewatering will cease immediately if any negative environmental impact such as flooding, erosion or dirty water discharge is observed.

Disposal of contaminated water

As detailed in Section Water quality criteria, if onsite water is unable to be treated to meet the criteria for application to land or discharge to waterways it must be disposed of at an appropriately licensed facility.

Records

The Project Environmental Representative will maintain records of relevant data, including records of water quality management and water discharge (Permit to Discharge).

A record will be maintained for each discharge that will include:

- Date and time for each discharge at each location
- Water quality test results for each discharge
- Personnel approving the dewatering activities
- Evidence of discharge monitoring, or risk assessment and mitigation measures used to eliminate the risks of pollution or erosion
- Details of aquatic fauna captured and relocated after dam dewatering has occurred.

Water Discharge Permit

Permit Number:			
Permit Start Date:		**Permit End Date:**	
Section 1: Permit Application Details			
Permit Applicant (Name):			
Permit Holder (Name):			
Permit Controller (Name):			
Work Location:			
Work Start Date:		**Work End Date:**	
ESCP Reference:			
SWMS Reference:			
Work Description / Proposed Point Of Discharge			

Section 2: Water Quality Record **To Be Completed By Water Quality Monitoring Personnel**				
Parameter	**Water to be Discharged**	**Receiving Water** Pre-discharge	**Receiving Water** During-discharge	**Receiving Water** Post-discharge (1hour)
Time:				
Turbidity: 75 NTU				
pH: 6.5 – 8.5				
Conductivity				
Dissolved Oxygen (DO%)				
Visual Oil and Grease				
Section 3: Permit Conditions				

Mandatory Permit Conditions:

- Float the foot valve to ensure it does not sit in mud at the base of the sediment basin.
- Ensure that the water discharge point is located so that it will not cause erosion and re-suspension of sediment.
- Check the discharge regularly to ensure it remains clear of visible sediment and appears clean. The person issuing this permit must test water quality in the receiving water on an hourly basis.
- Cease dewatering immediately if water quality in the receiving waterway is adversely affected or if a turbidity plume is visible.

(Hand write any additional conditions / instructions below)

Section 4: Approval, Issue, And Acceptance

I confirm that the documented controls have been implemented and the task will be performed in accordance with the permit requirements. Any change in circumstance will require review and re-issue of the permit before works proceed.

Permit Applicant	Company	Signature	Date
Permit Holder	**Company**	**Signature**	**Date**

I have sighted and reviewed this application, any attached plans/reports/documentation and the control measures detailed within. I confirm that works may proceed as described in this permit.

Permit Controller	Signature	Date

Section 5: Permit Closure

I confirm that all work for which this permit was issues has been completed.

Permit Holder	Company	Signature	Date
Permit Controller		**Signature**	**Date**

COPPERSTRING 2032

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COPPERSTRING 2032 JV

DANGEROUS GOODS MANAGEMENT PLAN

COPPERSTRING 2032

EDMS No : CSPW-HSW-PLN-900-000006
Revision : A02
Status : IFR
Date : 17/06/2024

Approvals and Reviews

Dangerous Goods Management Plan	
Project	CopperString 2032
Client	Powerlink Queensland Pty Ltd
Document Number	CSPW-HSW-PLN-900-000006

Revision History

Rev No.	Description of Revision	By	Checked	Approved	Date
A01	Developed for PDLA Work Contract	David Swain	Gus Micola, Neil Brooks	Micheal Dawson	03/05/2024
A02	Updated incorporating PQ comments received on 31/05/2024	David McLean	Padmaja Cuppala	Micheal Dawson	17/06/2024

This plan has been developed by UGL CPB JV to define the management objectives and practices that are to be implemented during the execution of Contract activities. It is the private property of the JV and without their consent must not be shown or given to any competitor or third parties or used by the recipient for purposes other than those for which they are issued. Any printed documents shall be considered as uncontrolled.

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Appendices

Appendix A Workflow Summary

1. Introduction

The purpose of the CopperString 2032 project is to connect the North West Minerals Province (NWMP) of Queensland to the National Electricity Grid. This will not only allow existing loads in the Mount Isa and Cloncurry areas to be fed from the National Electricity Market (NEM), but also provide access to new mining loads and opportunity for connection of renewable generation.

1.1 Project scope

The CopperString 2032 Project is an extra high voltage transmission system intended to connect the North West Power System (NWPS) near Cloncurry and Mount Isa to the Powerlink network and NEM at Mulgrave. Figure 1 provides an overview of the Project.



Figure 1 CopperString 2032 proposed transmission lines and substations

The CopperString 2032 Project will connect the NWMP to the NEM to reduce the cost of power supply and facilitate the large-scale development of the Hughenden wind resource and solar resources within the North Queensland Clean Energy Hub (NQCEH).

The scope of work, traversing east to west, consists of the following sections:

- Mulgrave 500/275kV Substation as the CopperString 500kV connection point to the Queensland SuperGrid and 275kV line augmentation as the CopperString 275kV connection point to the NEM
- Pentland 500kV Substation to support the North Queensland Clean Energy Hub (NQCEH) expansion and as the core for future load connections in the area
- Flinders 500/300kV Substation (Hughenden) as the core for the NQCEH
- Dajarra Road 330/220kV Substation (Cloncurry) as the core for distributions to larger load centres
- The primary CopperString transmission backbone
- Termination via the Mount Isa augmentation 220/132kV.

The scope consists of a transmission line between the above locations carrying extra high voltage power transmission at 500kV, 330kV and 220kV respectively. Substations at the abovementioned interconnecting junctions will distribute power to the NWMP and NQCEH.

1.2 Objectives of this plan

This Dangerous Goods Management Plan (DGMP) is a sub-plan to the overarching Project Execution Plan and is part of a suite of plans that form the Project Management System (PMS) for the CopperString 2032 Project.

The DGMP will be submitted for approval to Powerlink in accordance with the Contract and will be monitored, updated, and controlled throughout the construction phase of the project.

It outlines the JV requirements for the use, handling and storage of hazardous materials on the project.

The DGMP will be implemented as part of the execution of the Safety & Health Management Plan. The requirements of the DGMP will apply to all project site personnel, including the JV's workforce and subcontractors.

1.3 Abbreviations, acronyms and definitions

The following terms are used in this document and are used as part of this Plan.

Table 1 Abbreviations, acronyms, definitions

Term	Definition
ADG Code	Australian Dangerous Goods Code
AS	Australian Standard
CHEMWATCH	Chemical Safety and Safety Data Sheet Management System
CoR	Chain of Responsibility
CSM	Contractor Supplied Materials
DTMR	Department of Transport and Main Roads
DG	Dangerous Goods
DGMP	Dangerous Goods Management Plan
GHS	Global Harmonised System
HAZCHEM	Hazardous Chemicals
HSEQ	Health, Safety, Environment and Quality
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
NEM	National Electricity Market
NQCEH	North Queensland Clean Energy Hub
NWMP	North-West Minerals Provence
NTC	National Transport Commission
PQ	Powerlink Queensland Pty Ltd (Client)
PMS	Project Management System
PPE	Personal Protective Equipment
SDS	Safety Data Sheet
SMF	Synthetic Mineral Fibres
the Project	CopperString 2032 Project
the JV	UGL CPB JV
TMP	Traffic Management Plan
UGLMS	UGL Management System

2. Roles and Responsibilities

2.1 Roles and Responsibilities

The management structure for control of dangerous goods will be aligned to the project's organisational chart and is summarised in table below.

Table 2 Roles and Responsibilities

Role	Responsibilities
Employees and Contractors	• Assess the workplace and work task for hazardous substances before commencing any work • Ensure that, when applicable, engineering, and administrative controls and Personal Protective Equipment (PPE) shall be in place during handling of hazardous substances.
Supervisors and Area Managers	• Ensure that employees have the knowledge and proper training in handling of hazardous substances that will be encountered during the execution of work • Ensure that Safety Data Sheets (SDS) are available to the workers in the work area throughout each work shift – Chemwatch access • Update as required the SDS Register for their respective areas • Forward a copy of the updated register to the safety coordinator to be included in the site wide chemical register (SDS Register).
Safety / Environmental Coordinator	• Provide guidance for the assessment of hazardous substances and recommendations for controls • Facilitate hazardous substances assessments as and when required • Periodically audit and verify the adequacy and effectiveness of implemented control measures • Site wide hazardous substances register custodian.

3. Applicable Regulations

The Queensland Work Health and Safety Regulation 2011 covers workplace hazardous substances and dangerous goods under a single framework for hazardous chemicals.

Under the Work Health and Safety Regulation 2011 (WHS Regulation), all hazardous chemicals (manufactured or imported after 31 December 2016) must be classified and labelled in accordance with the *globally harmonised system for the classification and labelling of chemicals (GHS).*

Hazardous chemicals (Hazchem) is the name given to the group of chemicals classified as hazardous for use at workplaces according to the GHS. The GHS classification system focuses on chemicals with acute and chronic hazards to health and safety in the workplace.

Dangerous goods (DG) is the name given to the group of chemicals and articles (i.e. goods) classified as dangerous for transport by road, rail, air or sea. The DG classification systems focus on goods with predominately acute hazards to safety, the environment or the road and rail transport vehicle.

Transportation of DGs is regulated by government and various international bodies. DGs transported by road and rail are required to adhere to the National Transport Commissions (NTC), Australian Code for the Transport of Dangerous Goods by Road & Rail Edition 7.8, 2022 and all statutory requirements.

DGs transported by sea are classified according to the International Maritime Dangerous Goods Code (IMDG) and DGs transported by air are classified according to the International Air Transport Association (IATA) DG Regulations.

4. Requirements and standards

Appendix A contains our **Workflow Summary** that details the approach for the management of risks associated with hazardous chemicals.

4.1 Safety data sheets (SDS)

An Australian compliant safety data sheet (SDS) must be obtained from the supplier for each hazardous chemical. All hazardous substances supplied or introduced to a project site are required to be accompanied by a SDS, copies of which shall be located both where the hazardous substance is being used and where it is stored. The area supervisor shall maintain an inventory (Hazardous Substance Register) for each separate hazardous substance storage area on site.

The register and accompanying SDSs shall be available for viewing by all personnel via the Chemwatch management system.

The safety coordinator shall maintain a separate master inventory of hazardous substances stored on work fronts, sites/hubs and offices.

4.2 Risk assessment

A documented risk assessment shall be conducted prior to working with hazardous substances and repeated any time the scope of work changes or any surrounding conditions change. The risk assessment shall be compliant with JV's risk management protocols and include as a minimum:

- The potential for personnel to be adversely affected by the hazardous substances
- Other work occurring simultaneously in adjacent areas
- Selection of appropriate control measures using the hierarchy of controls
- The potential for weather or other external conditions to influence the work with hazardous substances (e.g. Wind, rain, dust, gases, poor lighting, temperature etc.)
- Selection of appropriate equipment
- Selection of appropriate PPE.

These risk assessments will be stored within the Chemwatch management system.

4.3 Authorisation to bring hazardous substances to site

New hazardous substances required for use, or trial, must have approval from the safety and environmental coordinators prior to transport and use on site. This ensures that the products are reviewed for potential risks to health and the environment in their use.

The SDS for each hazardous substance shall accompany the completed authorisation form.

4.4 Transport and transfer of materials

The transport of hazardous materials presents additional risks and shall be fully in compliance with the National Transport Commission's (NTC), Australian Code for the Transport of Dangerous Goods by Road & Rail- Seventh Edition 7.8 2022 in relation to the specific requirements for vehicles, transport supervisors, drivers, hazard communication and emergency management.

Industrial gas cylinders, full or empty, shall be securely fastened in upright cages or racks; they shall never be transported in a horizontal position unless designated by regulations as requiring transport by horizontal means.

Key points to note are as follows:

- Each hazardous material shall have a Safety Data Sheet (SDS) issued by the manufacturer accompanying the load

- Vehicles transporting hazardous materials shall comply with both Australia Code for the Transport of Dangerous Goods by Road & Rail requirements and all Project procedures
- Packaging and containers shall meet international minimum safety standards for the transport of hazardous materials
- Drivers shall have the relevant Personal Protective Equipment (PPE) readily available per the SDS requirements
- Drivers of hazardous materials loads must be trained experienced drivers, trained in Chain of Responsibility Laws (CoR) and the applicable load restraint requirements, who shall know what to do in an emergency, or after an accident.

Transfer of dangerous goods within and around sites must only occur on the correct type of vehicle dependent on the class of Hazmat and be packaged, secured and handled as per the products compliant SDS.

4.5 Receiving hazardous substances

The personnel responsible for receiving hazardous substances shall ensure that:

- Hazardous material deliveries are labelled in accordance with the Workplace Health and Safety Queensland (WHSQ) Code of Practice for the Labelling of Workplace Hazardous Chemicals and any damaged packages are returned to the supplier - WHSQ - Labelling of workplace hazardous chemicals-Code of Practice 2021
- Risks associated with the hazardous substances and dangerous goods have been identified
- Receiving personnel know how to respond to incidents during loading and unloading
- All equipment required, including correct PPE, is available
- Delivery and loading are supervised at all times
- Spillages are immediately contained and reported to the Safety and Environmental Coordinators.

4.6 Storage of hazardous substances

The relevant project Supervisor is responsible for ensuring that all hazardous chemicals on site are stored safely and in compliance with relevant legislation. This includes:

- Always storing hazardous chemicals as directed in the SDS
- Not storing incompatible substances together
- Ensure adequate storage cabinets/facilities are available for chemicals (e.g. Flammable liquids)
- Securing appropriate licences for storage, including stamped plans where needed
- Placarding the storage areas where required – as per the relevant state/territory regulations
- Ensuring that storage areas are protected against impact from mobile plant
- Ensuring storage facilities are secure
- Developing appropriate receiving procedures
- Monitoring usage through regular inspections, audits or stocktake activities
- Record keeping
- Identifying the segregation requirements for chemicals
- Including storage locations within the site map/plan
- As applicable storage solutions are to comply with Australian Standards (e.g., AS1940 and AS3780)
- Implementing environmental protection such as control of drainage to prevent spills into stormwater drains, and containment bunding to reduce risk of soil contamination where necessary.

Storage volumes planned for the project do not trigger the volume thresholds that would trigger classification as a 'notifiable activity' under Schedule 3 of the EP Act. In the event that these change the plan will be updated for this purpose.

4.7 Labelling

Labels should contain:

- Signal words (warning/poison/dangerous poison) and dangerous goods class or schedule
- Product name, chemical name, UN number, ingredients, and formulation details
- Risk phrases - e.g., "flammable", "irritating to skin" or "harmful if swallowed"
- Directions for use
- Safety information - e.g., "avoid contact with skin" or "do not breathe dust"
- First aid procedures
- Emergency procedures - control of leaks, spills or fires
- Details of manufacturer/supplier
- Expiry date

4.8 Reference to the product SDS.Training and competency

The applicable supervisor is responsible for ensuring that induction and on-going training is provided to all workers and subcontractors with the potential to be exposed to hazardous chemicals.

As part of the training, where hierarchy of risk control measures have not eliminated the use of PPE, personnel are to be trained and provided with specific fit tested PPE for control against the risk of certain substances. For example, where respiratory protection is required, the PPE shall be fit tested to ensure adequate seal is maintained, this may include being clean shaven.

The Supervisors must ensure workers are trained in the safe handling of hazardous chemicals, prior to their use and the sites applicable emergency response protocols.

Additional training may be required to handle specific substances such as solvents and synthetic mineral fibres where exposure standards apply.

4.9 Fire protection

The SDS shall always be consulted prior to working with a substance to ensure firefighting information is understood and required equipment is available

The site area manager is responsible for ensuring that all site amenities, office, workshops, vehicles, plant and storage facilities shall have a suitable type and number of fire extinguishers available for use in case of fire.

The selection and location of fire extinguishers shall be consistent with *AS/NZS 2444:2004 Portable Fire Extinguishers and Fire Blankets – Selection and Location*

4.10 Solvents, asbestos and synthetic mineral fibres

No asbestos or asbestos containing substances shall be brought onto sites. Solvents and synthetic mineral fibres (SMF) shall only be brought to site with prior written approval from the site manager, noting possible additional training for exposure standards for personnel handling such substances.

4.11 Radioactive substances – Hazard Class 7

No radioactive substances or equipment containing or requiring radioactive sources for operation shall be brought onto sites.

4.12 Removing and disposing of hazardous substances

The site manager will be responsible for ensuring that all waste and unused hazardous substances are removed from site in accordance with legislative requirements. Documented details of such disposal shall be forwarded to the site general manager for approval prior to disposal and records of all chemical disposals retained for inspection and audit (refer also to the Waste Management Plan).

4.13 Storage locations

The storage locations for any dangerous goods will be captured in the Construction Area Plan' s (CAP's) applicable to the project area. These are under development and are dependent on the detailed design, logistics and facilities.

5. Codes and references

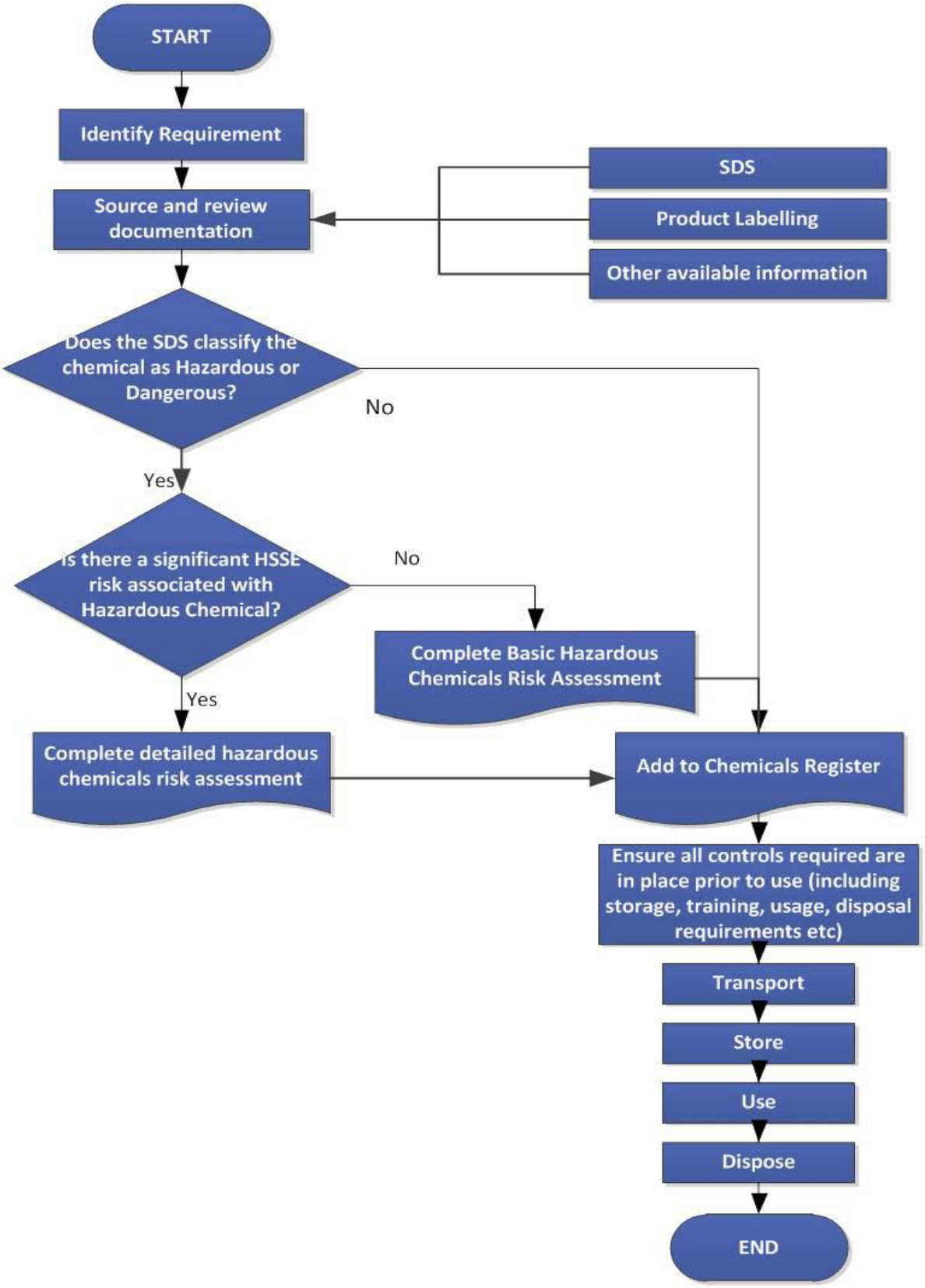
- WorkSafe Queensland – WorkSafe.qld.gov.au
- The Work Health and Safety Regulation 2011 Queensland
- National Transport Commission – Australian Dangerous Goods Code
- International Maritime Dangerous Goods Code (IMDG) Code
- International Air Transport Association (IATA)
- Qld Dangerous Goods Safety Management Act 2001
- Department of Transport and Main Roads, Queensland
- WHSQ Code of Practice 2021 – Labelling of workplace hazardous chemicals.
- AS1940:2004 Storage and Handling of flammable and combustible liquids
- AS2444:2008 Portable Fire Extinguishers and Fire Blankets – Selection and Location
- AS3870:2008 The storage and handling of corrosive substances

6. Plan Review and Control

This plan shall be reviewed on a regular basis but not greater than 12 monthly intervals in accordance with the requirements specified in the:

- JV Quality Management System requirements;
- CEMP Review; and
- PQ HSE Specification for contractors and suppliers.

Appendix A Workflow Summary



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CONSTRUCTION TRAFFIC MANAGEMENT PLAN Flinders Shire Council

COPPERSTRING 2032

EDMS No : CSPW-RDM-PLN-900-000003
Revision : A02
Date : 05/06/2024

IFR

Approvals and Reviews

Traffic Management Plan	
Project	CopperString 2032
Client	Powerlink Queensland Pty Ltd
Document Number	CSPW-RDM-PLN-900-000003

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A01	Developed for PDLA Work Contract	Dana Geaboc Traffic Manager RPEQ 15478 TMD578	Ryan Jones Project Manger	Matt Lennon	03/05/2024
A02	PQ comment to Rev A included	Dana Geaboc Traffic Manager RPEQ 15478 TMD578	Ryan Jones Project Manger	Matt Lennon	05/06/2024

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1. Introduction

1.1 Purpose

The UGLCPB JV (the JV) has engaged engineering consultants pitt&sherry to conduct Traffic Impact Assessments (TIA).

These assessments:

- evaluated the risk and impact of project-related construction vehicles on the operation, condition, and safety of the Flinders Shire Council (FSC) owned road network, as well as the Queensland Department of Transport and Main Roads (TMR) road network within the FSC LGA. (Refer to *pitt&sherry CopperString 2032 Traffic Impact Assessment - FSC, Feb 2024*)
- provided development application level of engineering associated with he construction accommodation camp at Hughenden to support the construction activities. (Refer to *pitt&sherry CopperString 2032 Hughenden Camp Hub Traffic Impact Assessment, Sep 2023*)

This Construction Traffic Management Plan (CTMP) has been developed based on the findings and recommendations of the pitt&sherry TIA report.

This Construction Traffic Management Plan sets out the approach to managing traffic and transport impacts on the Flinders Shire Council (FSC) roads during the construction of the CopperString 2032 project (the Project). The CTMP also outlines contractor requirements, with reference to third party agreements.

1.2 Scope

The CTMP provides the overall strategy and approach for construction traffic management for the Project, and an outline of the traffic management requirements and processes that will be common to each of the proposed work sites. It establishes the traffic management processes and acceptable criteria to be considered and followed in managing the FSC roads and footpaths adjacent to Project construction sites.

Site-specific Traffic Management Plan (TMP), along with Traffic Guidance Schemes (TGS) as required, will also be included in the CTMP.

The Construction Traffic Management Framework (CTMP) is one of several management plans required for the Project. The hierarchy of the Traffic Management Plans for the Project, their purpose, and the responsible entity for each are outlined in the table below.

Table 1 Traffic Management Plans hierarchy

Document	Purpose	Produced by
Traffic Management Plan (TMP)	Provides the approach within which subsequent overarching (contract wide) and site specific CTMPs will be prepared.	The Project (JV) – Traffic Manager
Construction Traffic Management Plan (CTMP)	CTMPs prepared for each LGA and TMR construction site	The Project (JV) – Traffic Manager
Site-specific TMP	Provides the approach within which subsequent overarching (contract wide) and site specific CTMPs will be prepared.	The TC provider
Traffic Guidance Schemes (TGS)	Prepared as part of the site-specific TMP or as a standalone drawing for submission with Corridor permit applications and/or council permits.	The TC provider

Document	Purpose	Produced by
Pedestrian Movement Plans (PMP) Vehicle Movements Plans (VMP) Parking Management Plan (PkMP)	Site-specific for each construction site, they can be individual or all in one diagram	The Project (JV) – Site/Project Engineers

1.3 Abbreviations, acronyms & definitions

All terminology in this Construction Management Plan (CTMP) is taken to mean the generally accepted or dictionary definition.

Table 2 Abbreviations, acronyms & definitions

Term	Definition
Approval	Any licence, permit, consent or approval required to be obtained from any authority to perform the construction activities or required in relation to the Project.
Construction site	The land, structures and water bodies where the contractor undertakes the contractor's activities.
Construction Traffic Management Plan (CTMP)	The EIS Approval necessitates the development of a Construction Traffic Management Plan (CTMP). This plan outlines the strategies for managing traffic and transportation during construction activities. It details the proposed work activities, their potential impact on roadways and road users, and the measures taken to mitigate these impacts. For the CopperString 2032 Project, CTMPs will be created for each Local Government Area (LGA), Camp Hub, and Department of Transport and Main Roads (TMR), covering all construction sites. These plans will be developed collaboratively with the LGAs and TMR. This CTMP only covers for the roads within Flinders Shire Council area.
Contractor	The organisation engaged by the Project for the delivery of the Project Works and the Temporary Works.
Emergency	An unforeseen event which requires urgent action to protect life or property, or an occasion when emergency services (Police, Fire and Rescue, Ambulance or State Emergency Services) take control of a portion of the road network.
Long-term works	Works that impact on the road network for more than one shift. Traffic management measures will be installed on one day/night and remain in place for weeks or months but are removed on completion of the project or that work; for example, concrete barriers and signage.
Pedestrian Movement Plan (PMP)	A diagram showing the allocated travel paths for workers or pedestrians around or through a construction site. A PMP may be combined with or superimposed on a Traffic Guidance Scheme.
Reference documents	The codes, standards, specification and guidelines specified in this document.
Road Safety Audit (RSA)	An assessment and report of a road's safety performance and crash potential at various stages of a road/project's life cycle.
Road user	All users of roads and public spaces including, but not limited to, pedestrians, pedal cyclists, public transport passengers, public transport operators and motorists.
Short-term works	Works that are undertaken for one shift only. They may return the next day/night but it is set up and packed entirely in one shift; for example, cones and signs for a lane closure.

Term	Definition
Subcontractor	A subcontractor of the contractor and includes a supplier of goods or services (including professional services and construction plant hire) or both.
Traffic Guidance Scheme (TGS)	A diagram showing signs and devices arranged to warn traffic and to guide it around, past or if necessary, through a work site or temporary hazard.
Traffic Management Plan (TMP)	The TMP is a plan showing how traffic will be managed when construction works which will impact on the surrounding road network are being carried out. It describes the work activities being proposed, their impact on the roadway and on road users, and how these impacts are being addressed.
Vehicle Movement Plan (VMP)	A diagram showing the preferred travel paths for vehicles associated with a construction site entering, leaving or crossing the through traffic stream. A VMP may be combined with or superimposed on a Traffic Guidance Scheme.

Abbreviation	Description
AADT	Annual Average Daily Traffic
ASD	Approach Sight Distance
CSC	Cloncurry Shire Council
CTRC	Charters Towers Regional Council
EDD	Extended Design Domain
FFS	Free Flow Speed
FSC	Flinders Shire Council
HML	Higher Mass Limit
HV	Heavy Vehicle
JV	UGL/CPB Joint Venture
LGA	Local Government Authority
LOS	Level of Service
MICC	Mount Isa City Council
MID	Major Infrastructure Development
MSC	McKinlay Shire Council
NDD	Normal Design Domain
NEM	National Electricity Market
NQCEH	North Queensland Clean Energy Hub
NWMP	North West Minerals Province
OSOM	Oversize Overmass
PTSF	Percentage Time Spent Following
RSC	Richmond Shire Council
RUMP	Road User Management Plan
SC	State Controlled
SISD	Safe Intersection Sight Distance
SSD	Stopping Sight Distance

Abbreviation	Description
TCC	Townsville City Council
TIA	Traffic Impact Assessment
TMR	Department of Transport and Main Roads (Queensland)
VPD	Vehicles Per Day
VPH	Vehicles Per Hour

1.4 Legislative context and standards

The following Australian Standards and Guidelines have been used throughout this report:

- Austroads Guide to temporary Traffic Management Parts 1 – 10
- Queensland Guide to temporary Traffic Management Parts 1 – 10
- AS 1742.2:2009 Manual of uniform traffic control devices – Part 2: Traffic control devices for general use
- AS 1742.7:2016 Manual of uniform traffic control devices – Part 7: Railway crossings
- AS 2890.2:2018 Parking facilities – Part 2: Off-street commercial vehicle facilities
- Austroads Guide to Road Design Part 3: Geometric Design
- Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections
- Austroads Guide to Road Design Part 4B: Roundabouts
- Austroads Guide to Road Safety Part 6A: Implementing Road Safety Audits
- Austroads Guide to Traffic Management Part 3: Transport Studies and Analysis Methods
- Austroads Guide to Traffic Management Part 6: Interchanges and Crossings Management
- Department of Transport and Main Road's Supplement to Austroads Guide to Road Design Part 3: Geometric Design
- Department of Transport and Main Road Supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections
- Department of Transport and Main Road Supplement to Austroads Guide to Road Design Part 4B: Roundabouts
- Department of Transport and Main Roads Routine Maintenance Guidelines – November 2017
- Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis
- Department of Transport and Main Road's Guide to Traffic Impact Assessment – December 2018.

This document is the latest approved revision of this Plan however, this document remains live for the purposes of construction and is under regular review and amendment to suit conditions on site.

2. The Project

The purpose of the CopperString 2032 project is to connect the North West Minerals Province (NWMP) of Queensland to the National Electricity Grid. This will not only allow existing loads in the Mt Isa and Cloncurry areas to be fed from the National Electricity Market (NEM), but also provide access to new mining loads and opportunity for connection of renewable generation.

2.1 Project scope

The CopperString 2032 Project is an extra high voltage transmission system intended to connect the North West Power System (NWPS) near Cloncurry and Mount Isa to the Powerlink network and NEM at Mulgrave. Figure 1 provides an overview of the Project.



Figure 1 CopperString 2032 proposed transmission lines and substations

The CopperString 2032 Project will connect the NWMP to the NEM to reduce the cost of power supply and facilitate the large-scale development of the Hughenden wind resource and solar resources within the North Queensland Clean Energy Hub (NQCEH).

The scope of work, traversing east to west, consists of the following sections:

- Mulgrave 500/275kV Substation as the CopperString 500kV connection point to the Queensland SuperGrid and 275kV line augmentation as the CopperString 275kV connection point to the NEM
- Pentland 500kV Substation to support the North Queensland Clean Energy Hub (NQCEH) expansion and as the core for future load connections in the area
- Flinders 500/300kV Substation (Hughenden) as the core for the NQCEH
- Dajarra Road 330/220kV Substation (Cloncurry) as the core for distributions to larger load centres
- The primary CopperString transmission backbone
- Termination via the Mount Isa augmentation 220/132kV.

The scope consists of a transmission line between the above locations carrying extra high voltage power transmission at 500kV, 330kV and 220kV respectively. Substations at the abovementioned interconnecting junctions will distribute power to the NWMP and NQCEH.

2.2 Project location

The transmission line will run approximately parallel to the Flinders Highway at an average of 15km south of the Highway for its length.

The Project traverses 7 Local Government Areas (LGAs):

- Burdekin Shire Council
- Charters Towers Regional Council
- Flinders Shire
- Richmond Shire
- McKinlay Shire
- Shire of Cloncurry
- City of Mount Isa.

TMR and LGA roads are used to access the transmission lines, camps, substations, materials and storage for the project in the majority of LGAs. In Burdekin Shire Council only TMR roads are used for access.

It is noted that vehicles use TMR and LGA roads in the Townsville LGA to access the Townsville Port for delivery of materials.

The major towns within proximity to the Project are Townsville, Charters Towers, Hughenden, Richmond, Julia Creek, Cloncurry and Mount Isa.

The project traverses the traditional lands of the Birriah, Jangga, Yirendali, Wanamara, Mitakoodi, Kalkadoon and Yulluna Peoples, Traditional Custodians of the land.

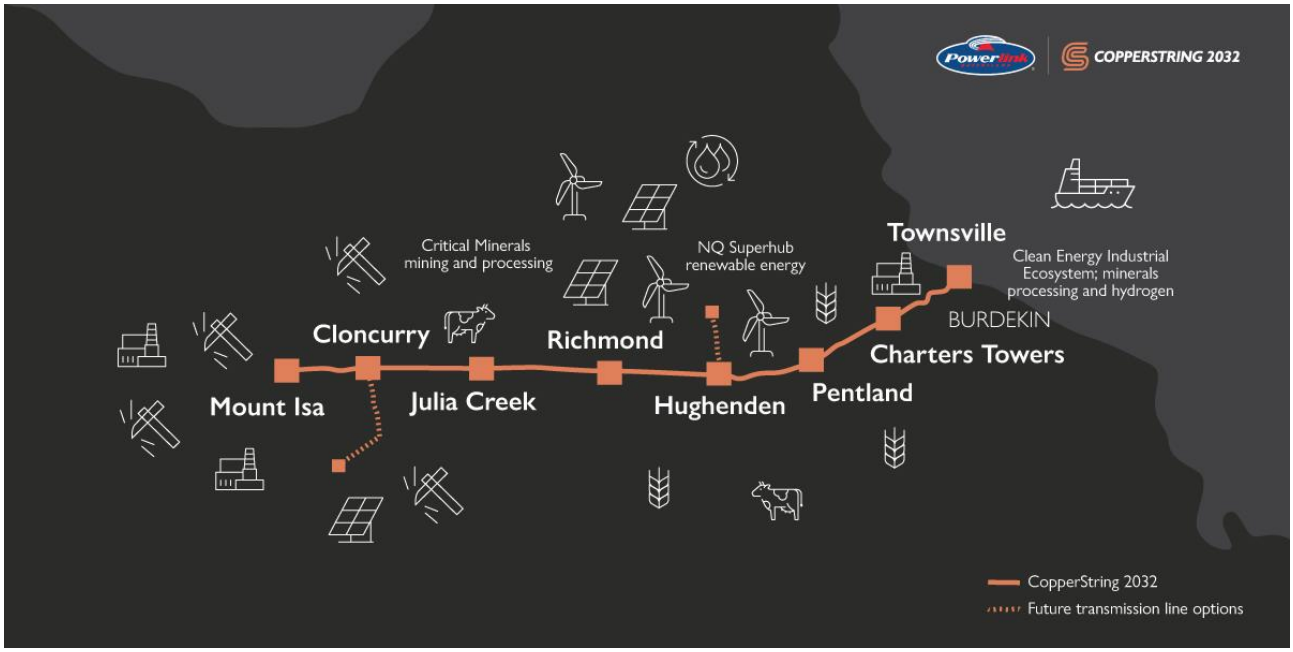


Figure 2 Project map geographic location (source document https://www.powerlink.com.au/projects/copperstring-2032)

CopperString 2032 Project is divided into eight logistics hubs, essentially creating Sub-Projects which have a defined scope based on the elements within their defined geographical area. Each hub has a geographical area defined by the minimisation of travel time from the camp to the tower location.

Work zones are based around the construction hubs and intended to limit travel time to tower sites to no more than 90 minutes.

Table 3 Logistics hubs

#	Hub	Camp	Substation	Towers
1	Mount Isa	Local accommodation	Mount Isa Substation	Mount Isa Sub to “Cloncurry & Mount Isa midpoint
2	Cloncurry	Camp	Dajarra Rd Substation	Darjarra Sub to Cloncurry River Dajarra Sub to Cloncurry & Mount Isa midpoint Dajarra Sub to Cloncurry & Julia Creek Midpoint
3	Julia Creek	Camp	Nil	Cloncurry & Julia Creek midpoint to Julia Creek & Richmond midpoint
4	Richmond	Camp	Nil	Julia Creek & Richmond midpoint to Richmond & Hughenden midpoint
5	Hughenden	Camp	Flinders Substation	Flinders Sub to Richmond & Hughenden midpoint Finders Sub to Mount James Flinders Sub to Hughenden & Pentland midpoint
6	Penland	Camp	Pentland Substation	Hughenden & Pentland midpoint to Pentland & Charters Towers midpoint
7	Charters Towers	Camp	Nil	Pentland & Charters Towers midpoint to Burdekin River
8	Woodstock	Local accommodation	Mulgrave Substation	Burdekin River to Mulgrave Substation

The location of camps proposed to be utilised during the Project is shown below in Table 4. It is noted that there are no camps at Woodstock or Mount Isa with workers staying in accommodation in the nearest town.

Table 4 Camp locations

Location	Council	Distance from nearest town
Charters Towers	Charters Towers Regional Council	3km
Pentland	Charters Towers Regional Council	2km
Hughenden	Flinders Shire Council	2km
Richmond	Richmond Shire Council	1km
Julia Creek	McKinlay Shire Council	1km
Cloncurry	Cloncurry Shire Council	4km
Woodstock	Townsville City Council	In south Townsville
Mount Isa	Mount Isa City Council	In Mount Isa

3. Existing traffic conditions

3.1 Existing road network

3.1.1 Roads

The project intends to incorporate FSC-owned roads into its route. All FSC-owned roads and SC roads within the LGA to be utilized during construction are detailed in Table 5 and depicted in Figure 3. These roads, identified below, collectively constitute the project route throughout this report.

Table 5 Roads

Road name	Road owner	Section	Road surface	Traffic volumes 2023 AADT Veh/day	% HV	HV approved
Flinders Highway	TMR	Full extent	Sealed	658	36%	Type 2 road train approved
Aramac Torrens Creek Road	TMR	Flinders Highway to transmission line easement	Sealed	164	34%	Type 2 road train approved
Cotonvale Road	Private	Flinders Highway to transmission line easement	-	<10	Unknown	
Prairie Road	FSC	Flinders Highway to Woodbine Access	Sealed	<100	Unknown	
Woodbine Access	Private	Prairie Road to transmission line easement	-	<10	Unknown	
Kennedy Energy Park Access Track	Private	Flinders Highway to transmission line easement		Unknown	Unknown	
Redcliffe Road	FSC	Flinders Highway to transmission line easement	Gravel	20	Unknown	
Unnamed Road (off Flinders Highway at Hughenden - to Hughenden Camp)	FSC	Flinders Highway to Hughenden Camp	Dirt	<10	Unknown	
Kennedy Developmental Road (south)	TMR	Flinders Highway to transmission line easement	Sealed	926	15%	

Road name	Road owner	Section	Road surface	Traffic volumes 2023 AADT Veh/day	% HV	HV approved
Kennedy Developmental Road (south)	TMR	Flinders Highway to transmission line easement	-	177	30%	Type 2 road train approved
Flinders Highway	TMR	Flinders Highway to transmission line easement	-	523	43%	
Unnamed Road (off Flinders Highway - to PTL-FLR_284 to FLR-DJR_82)	FSC	Flinders Highway to transmission line easement	Gravel	<10	Unknown	
Thornhill Tamworth Road	Private	Flinders Highway to transmission line easement	Gravel	<10	Unknown	
Marathon Stamford Road	FSC	Full extent	Sealed	12	Unknown	
Barabon Terranburby Road	FSC	Flinders Highway to transmission line easement	Sealed	12	Unknown	

Figure 3 Flinders Shire Council Project route



3.1.2 Intersections

State-controlled intersections

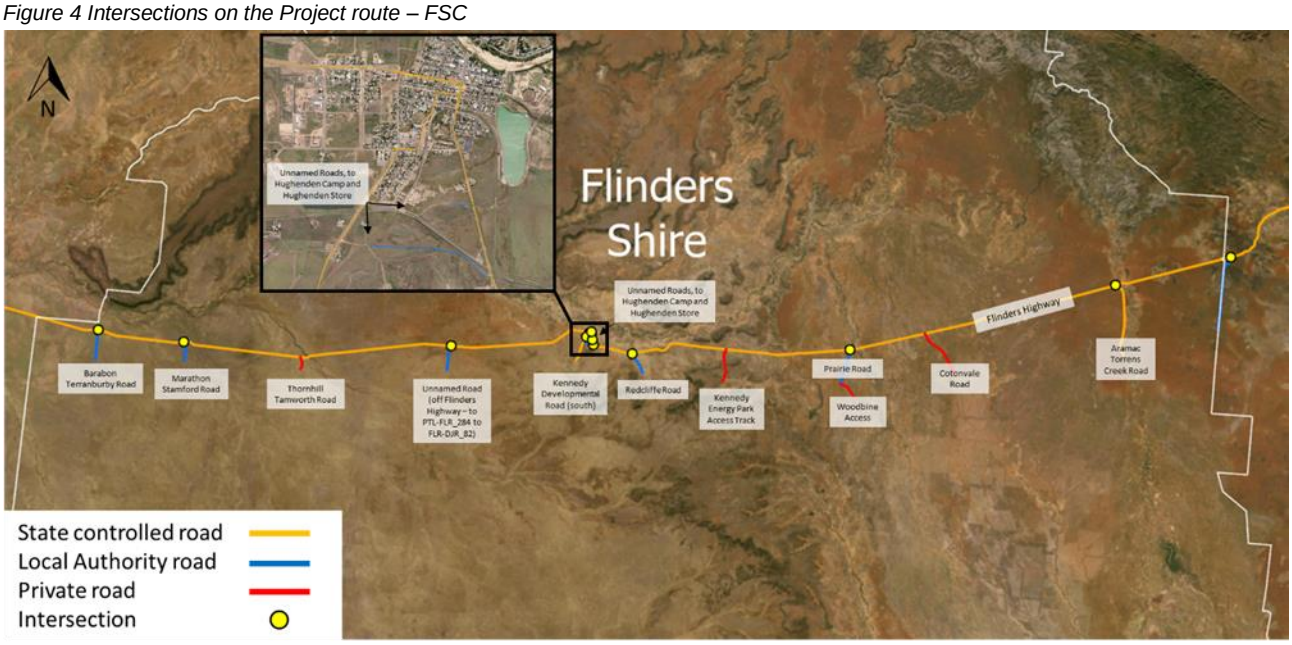
Intersections between SC roads and other SC roads, between SC roads and FSC roads, and between FSC roads and FSC roads on the Project route within the FSC LGA are summarised in Table 6.

Table 6 Intersections

Intersection ID	Intersection		HV approval	Intersection type
	Road 1	Road 2		
Intersections between SC and SC roads				
7.12	Flinders Highway	Aramac Torrens Creek Road	Type 2 road train approved	Unsignalised T-intersection
7.17	Flinders Highway	Kennedy Developmental Road (south) (Mowbray Street)	Type 2 road train approved	Unsignalised 4-way intersection
7.18	Flinders Highway* (Gray Street)	Flinders Highway* (Stansfield Street)	Type 2 road train approved	Unsignalised 4-way intersection
45.1	Kennedy Developmental Road (south)* (Resolution Street)	Kennedy Developmental Road (south)* (Mowbray Street)	Type 2 road train approved	Unsignalised 4-way intersection
Intersections between SC and FSC roads				
7.13	Flinders Highway	Prairie Road	Not approved	Unsignalised 4-way intersection
7.14	Flinders Highway	Redcliffe Road	Not approved	Unsignalised T-intersection
7.16	Flinders Highway	Unnamed Road (off Flinders Highway at Hughenden - to Hughenden Camp)	Not approved	Unsignalised T-intersection
45.2	Kennedy Developmental Road (south)	Kennedy Developmental Road (south)* (Mclaren Street)	Type 2 road train approved	Unsignalised T-intersection
7.19	Flinders Highway	Unnamed Road (off Flinders Highway - to PTL-FLR_284 to FLR-DJR_82)	Not approved	Unsignalised T-intersection
7.20	Flinders Highway	Marathon Stamford Road	Not approved	Unsignalised 4-way intersection
7.21	Flinders Highway	Barabon Terranburby Road	Not approved	Unsignalised 4-way intersection

Flinders Shire Council LGA intersections are shown below in Figure 4.

Figure 4 Intersections on the Project route – FSC



3.1.3 Driveways

To access the transmission line easement, a number of existing and proposed access tracks will be utilised. The access tracks have been named based on the towers in which they are proposed to service.

Intersections within the FSC LGA between roads and access tracks have been termed as driveways. The driveways that intersect the roads are outlined below in Table 7.

Table 7 Driveways

Driveway ID	Driveway	Road owner	Latitude	Longitude
37.A	Aramac Torrens Creek Road and Western Access to PTL-FLR-T89_118	TMR	-20.87870429	145.0265674
37.B	Aramac Torrens Creek Road and Eastern Access to PTL-FLR-T119_168	TMR	-20.87871775	145.0264362
7.A	Flinders Highway and Cotonvale Road	TMR	-20.84610402	144.7184491
39.A	Prairie Road and Woodbine Access	FSC	-20.92467689	144.5876582
7.B	Flinders Highway and Kennedy Energy Park Access Track	TMR	-20.87059872	144.4094707
42.A	Redcliffe Road and Western Access to PTL-FLR-T239_263	FSC	-20.906231947	144.2796049412
42.B	Redcliffe Road and Eastern Access to PTL-FLR-T264_283	FSC	-20.906251936	144.2795498532
44.A	Unnamed Road (off Flinders Highway at Hughenden - to Hughenden Camp) and Hughenden Camp Access	FSC	-20.856340319	144.1991997136
44B				
45.A	Kennedy Developmental Road (south) and Western Access to PTL-FLR-T264_283	TMR	-20.88713636	144.1760751

Driveway ID	Driveway	Road owner	Latitude	Longitude
45.B	Kennedy Developmental Road (south) and Eastern Access to PTL-FLR-T284_FLR-DJR-38	TMR	-20.88709695	144.1760069
46.A	Unnamed Road (off Flinders Highway) and Western Access to PTL-FLR-T284_FLR-DJR-38	FSC	-20.902068536	143.97612386312
46.B	Unnamed Road (off Flinders Highway) and Eastern Access to FLR-DJR-39_82	FSC	-20.902085764	143.9759965047
7.C	Flinders Highway and Thornhill Tamworth Road	TMR	-20.88273699	143.7482221
48.A	Marathon Stamford Road and Western Access to FLR-DJR-T83_116	FSC	-20.88800737	143.5676812
48.B	Marathon Stamford Road and Eastern Access to FLR-DJR-T117_142	FSC	-20.88799976	143.567567
49.A	Barabon Terranburby Road and Western Access to FLR-DJR-T117_142	FSC	-20.88521618	143.4297283
49.B	Barabon Terranburby Road and Eastern Access to FLR-DJR-143_179	FSC	-20.88521925	143.4296481

Driveways within the FSC LGA are shown below in Figure 5.

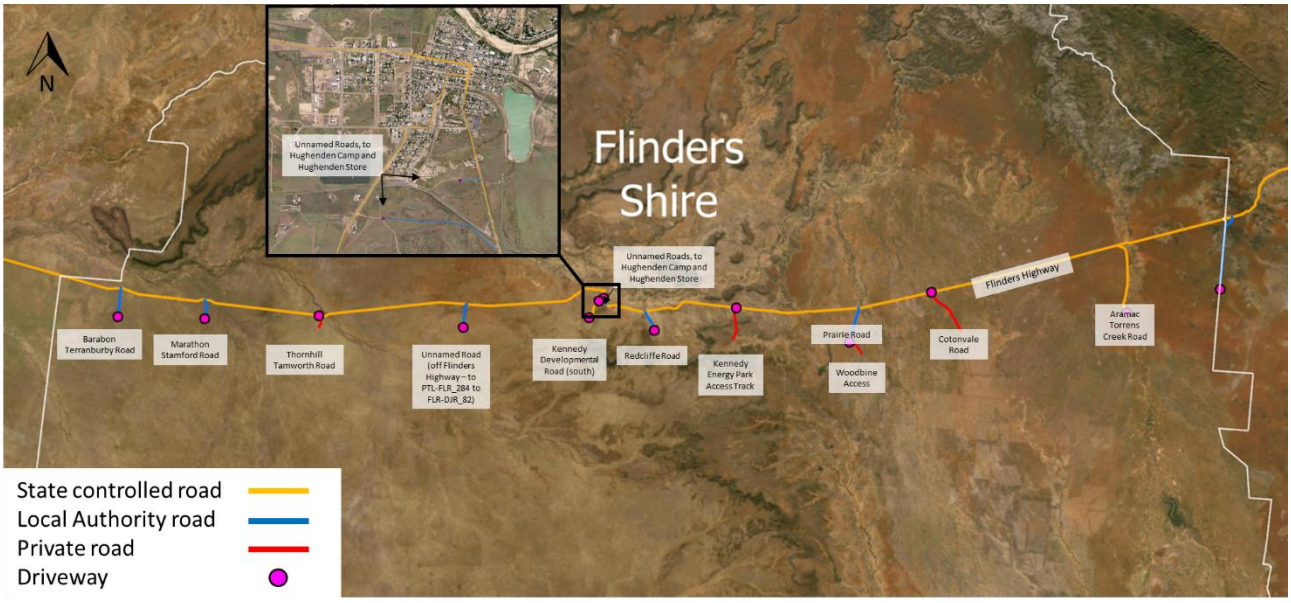


Figure 5 Driveways

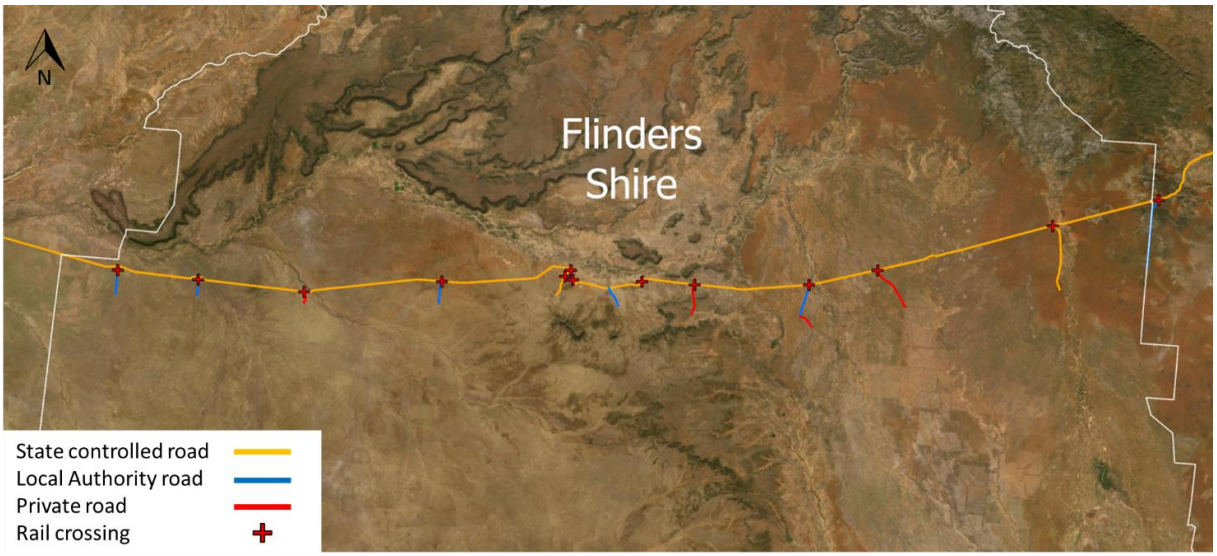
3.1.4 Rail crossing

The Project route will require vehicles to travel over Mount Isa Line rail crossings. The location of Mount Isa rail crossings on the Project route is shown in Figure 6 and outlined below in Table 8, noting that there is an impact of queueing onto SC and LGA roads from rail crossings located on LGA and privately-owned roads at some locations.

Table 8 Rail crossings

Crossing Name	Road owner	Active or passive control	Latitude	Longitude
Mount Isa Line: Aramac Torrens Creek Road crossing	TMR	Passive - give-way controlled (southbound), stop controlled (northbound)	-20.771843	145.014835
Mount Isa Line: Cotonvale Road crossing	Private	Passive - stop sign controlled	-20.843179	144.734995
Mount Isa Line: Prairie Road crossing	FSC	Passive - stop sign controlled	-20.871547	144.60266
Mount Isa Line: Kennedy Energy Park Access Track crossing	Private	Passive - stop sign controlled	-20.871321	144.409346
Mount Isa Line: Flinders Highway (east of Redcliffe Road) crossing	TMR	Active	-20.865722	144.320159
Mount Isa Line: Flinders Highway (Hughenden south) crossing	TMR	Active	-20.862986	144.203219
Mount Isa Line: Flinders Highway (Hughenden north) crossing	TMR	Active	-20.846558	144.199869
Mount Isa Line: Kennedy Developmental Road (south) crossing	TMR	Passive - give-way controlled	-20.857077	144.189793
Mount Isa Line: Unnamed Road (off Flinders Highway - to PTL-FLR_284 to FLR-DJR_82) crossing	FSC	Passive - stop sign controlled	-20.865709	143.98156
Mount Isa Line: Thornhill Tamworth Road crossing	Private	Passive - give-way controlled	-20.883069	143.748177
Mount Isa Line: Marathon Stamford Road crossing	FSC	Passive	-20.862421	143.569433
Mount Isa Line: Barabon Terranburby Road crossing	FSC	Passive	-20.846347	143.433425

Figure 6 Rail crossings



3.1.5 Other structures impacted by the Project

Table 9 details other locations or structures of interest that were identified during the site investigations within the Flinders Shire Council. Locations or structures of interest typically are those which may require change of proposed routes or cause an increased risk for traffic generated by the project within the study area. They include bridges, school zones, tight curves and turns, cattle grids, floodways and roads with load limits or that are B-double exempt. Note that some locations and structures of interest may have been missed, particularly culverts and the like, due to them often being difficult to see whilst driving at higher speeds. A further assessment of loading of bridge structures (bridges and culverts) should be undertaken prior to the start of construction.

Table 9 Other structure and locations of interest

Road ID	Road name	Road owner	Location/ structure type	Latitude	Longitude
7	Flinders Highway	TMR	Bridge	-20.76818102	145.0327662
37	Aramac Torrens Creek Road	TMR	Railway crossing	-20.77188328	145.0147655
7	Flinders Highway	TMR	Bridge	-20.8223237	144.8171786
7	Flinders Highway	TMR	School zone	-20.87088731	144.6061855
39	Prairie Road	FSC	SWER line crossing road	-20.87223531	144.6027705
39	Prairie Road	FSC	SWER line crossing road	-20.87862431	144.6019365
39	Prairie Road	FSC	Transmission line crossing road	-20.89501331	144.5961035
39	Prairie Road	FSC	Cattle grid	-20.9214022	144.5883258
7	Flinders Highway	TMR	Culvert	-20.8767069	144.4719753
7	Flinders Highway	TMR	Culvert	-20.87620971	144.46555
7	Flinders Highway	TMR	Culvert	-20.86973832	144.4008565
7	Flinders Highway	TMR	Culvert	-20.86923375	144.3957958

Road ID	Road name	Road owner	Location/ structure type	Latitude	Longitude
7	Flinders Highway	TMR	Rail crossing	-20.86573533	144.3201515
7	Flinders Highway	TMR	Culvert	-20.86759887	144.3185899
7	Flinders Highway	TMR	Culvert	-20.87142709	144.2947931
7	Flinders Highway	TMR	Culvert	-20.87209366	144.2913426
42	Redcliffe Road	FSC	Gate	-20.878056	144.264722
7	Flinders Highway	TMR	Rail crossing	-20.86299938	144.2032117
7	Flinders Highway	TMR	Rail crossing	-20.84657134	144.1998615
45	Kennedy Developmental Road (south)	TMR	School zone (Hughenden State School - 40 zone (8am to 9am and 2:30pm to 3:30pm))	-20.84500734	144.1978025
7	Flinders Highway	TMR	Culvert	-20.84282673	144.1948405
45	Kennedy Developmental Road (south)	TMR	Rail crossing	-20.85709034	144.1897965
7	Flinders Highway	TMR	Culvert	-20.84088859	144.1773307
7	Flinders Highway	TMR	Culvert	-20.84827126	144.1575258
7	Flinders Highway	TMR	Culvert	-20.86735678	144.0087713
7	Flinders Highway	TMR	Culvert	-20.88021928	143.7678219
7	Flinders Highway	TMR	Bridge	-20.88164399	143.7624969
7	Flinders Highway	TMR	Bridge	-20.88232007	143.7609064
7	Flinders Highway	TMR	Culvert	-20.88354241	143.7554193
7	Flinders Highway	TMR	Culvert	-20.86492235	143.5947326
7	Flinders Highway	TMR	Bridge	-20.86393779	143.5863282
7	Flinders Highway	TMR	Bridge	-20.86383312	143.5854424
48	Marathon Stamford Road	FSC	Cattle grid	-20.86305555	143.56944
7	Flinders Highway	TMR	Culvert	-20.86008225	143.5534759
7	Flinders Highway	TMR	Culvert	-20.85393095	143.5010816
7	Flinders Highway	TMR	Culvert	-20.85080381	143.4745102
7	Flinders Highway	TMR	Bridge	-20.84289101	143.4443007
49	Barabon Terranburby Road	FSC	Rail Crossing	-20.846111	143.4333
49	Barabon Terranburby Road	FSC	Cattle grid	-20.8591666	143.43221

It is expected that the vast majority of bridges and culverts on FSC roads would be sufficient for the project traffic. On roads which B-double trucks do not frequently use, all bridges, culverts and other items of interest should be inspected prior to project traffic travelling on them.

3.2 Special permit vehicles

OSOM vehicles which require a special permit will be required for transportation of the modular buildings at the substations and other oversized electrical and substation equipment. The size of these vehicles is currently unknown; and therefore, the following will be implanted, as a minimum:

- Once the size of the vehicle(s) is known, the exact route of the vehicle is assessed and specified based on road geometry, condition, and safety considerations
- The oversized vehicle travels to site with escort vehicle(s); and
- Appropriate traffic management is in place when the vehicle is accessing / egressing the site, in accordance with the requirements of Australian Standard AS1742.7-2016 Manual of uniform traffic control devices – Part 7: Railway crossings.

3.3 Public transport network

Available buses provide the main form of public transport to and from Hughenden. Bus services run between Townsville and Mount Isa stopping at Hughenden at the following times:

- Townsville – Mount Isa: Monday 10:30AM, Wednesday 11:15PM and Saturday 12:15PM; and
- Mount Isa – Townsville: Tuesday 6:05PM, Thursday 1:55AM and Sunday 1:55PM.

3.4 Pedestrian and cyclist network

There are no designated pedestrian and cyclists' networks within Flinders Shire Council Project area.

4. Project generated traffic

4.1 Overview

Many different components of the CopperString 2032 project generate traffic onto the public road network. These include:

- Construction, operation and demobilisation of the worker camps
- Construction and operational maintenance of the transmission line
- Construction and operational maintenance of the substations.

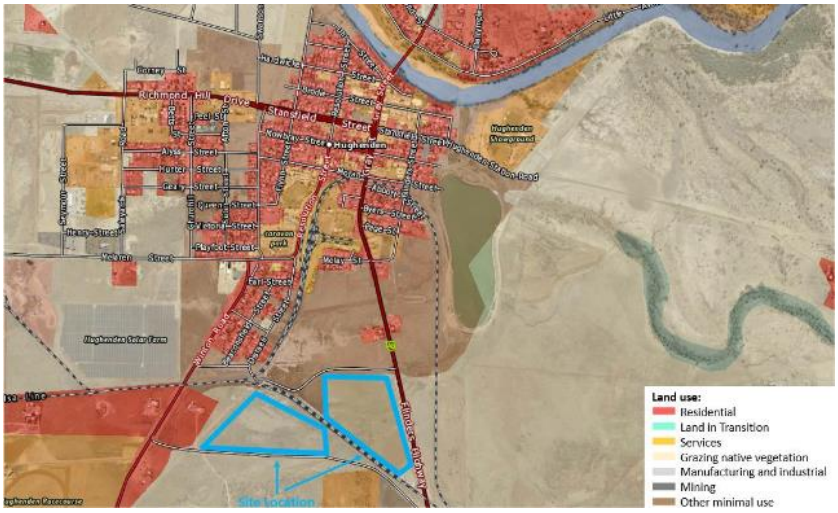
4.2 Hughenden camp operation traffic

4.2.1 Site location

The site is located in Hughenden approximately 1.6km from the Hughenden township and adjacent to the Flinders Highway. The Hughenden camp is located approximately 4km north of the CopperString 2032 corridor.

Figure 7 shows the site in a local context.

Figure 7. Site location (source: Queensland Globe, 2023)



4.2.2 Site access

Access to Hughenden camp is gained to the local road, no direct access is permitted between Flinders Highway and Lot 129 on SP119557 unless otherwise approved by DTMR.

Prior to the commencement of use of the Hughenden workers accommodation camp, road works comprising a Channelised Right (CHR) and Auxiliary Left (AUL) turn treatment must be provided generally in accordance with Channelised Right Turn (CHR) / Auxiliary Left Lane (AUL), prepared by pitt&sherry, dated 30 April 2024, reference CU2-HU00-SKT-PAS-100-0102.

4.2.3 Operational traffic information

4.2.3.1 Workforce

The Hughenden Camp Hub is located in the FSC LGA and is expected to have a maximum workforce of 410 people.

4.2.3.2 Vehicle types and use

The following vehicle types would be generated by the Hughenden camps:

- Light crew vehicles
- 12-seater minibuses (to take larger crews)
- Rigid crew trucks with equipment
- Rigid delivery trucks to take materials in and out of the camps
- Truck and dog vehicles to take materials in and out of the camps
- Semi-trailers to take materials in and out of the camps; and
- B-double trucks to take materials in and out of the camps.

4.2.3.3 Workforce movement and traffic routes

All movements in and out of the camps will take the most direct route to the nearest major highway (generally either the Flinders or Barkly Highway) and travel to their destination.

Generally, all workers will depart the camp in the morning peak hour (6:30am to 7:30am) and head to their worksite on the CopperString 2032 corridor, in the afternoon peak hour (5:30pm to 6:30pm) they will return to the camp. Deliveries occur periodically throughout the day.

More detailed information regarding the operation and traffic routes used by the camps can be found in the CopperString 2032 Camps TIAs (see Section 1.6 of this report for references to the CopperString 2032 Camps TIAs).

4.2.4 Camp traffic volumes

Table 10 shows the expected traffic volumes to be generated by the Hughenden Camp Hub on the expected typical busiest day and Table 11 shows the expected traffic volumes to be generated by the Hughenden Camp Hub during the peak hour of the expected typical busiest day.

It is noted that all traffic volumes stated in the traffic generation of the works are movements, i.e. if a vehicle travels in and out of the site that would generate two movements.

Table 10 Hughenden Camp Hub traffic generation – typical busiest day

General workforce traffic generation			Deliveries/ Removing goods traffic generation		
Light vehicles	Minibuses	Rigid trucks	Rigid trucks	Semi trailers / truck and dog	B-doubles
310	40	32	40	4	4

Table 11 Hughenden Camp Hub traffic generation – peak hour of typical busiest day

General workforce traffic generation			Deliveries/ Removing goods traffic generation		
Light vehicles	Minibuses	Rigid trucks	Rigid trucks	Semi trailers/ truck and dog	B-doubles
155	20	16	4	-	-

4.3 Transmission lines

4.3.1 Construction traffic information

4.3.1.1 Construction activities

Construction of the transmission lines results in the following traffic generating activities:

- Site establishment (civil, earthworks)
- Tower foundation works
- Tower assembly and erection
- Line stringing
- Anti-climbing device
- Rehabilitation.

4.3.1.2 Construction activities

The following vehicle types would be generated during the construction works:

- Vehicles from the camps
- Water trucks
- Rigid delivery vehicles and semi-trailers and truck and dog vehicles for other materials (i.e. fill from quarries, waste removal, cages for foundations, concrete trucks etc.)
- B-double trucks for delivery of the tower sections from Townsville.

4.3.1.3 Construction program

The peak of construction in the FSC LGA is generally in line with the Hughenden Camp Hub operation and is expected to occur between September 2024 and July 2026.

It is noted that the construction program is still fluid at the time of publishing this report due to ongoing changes to the permanent design scope.

4.3.2 Construction traffic volumes

Table 12 shows the expected traffic volumes to be generated in a localised area of the CopperString 2023 construction on the expected typical busiest day and Table 13 shows the expected traffic volumes to be generated in a localised area of the CopperString 2032 construction during the peak hour of the expected typical busiest day. It is noted that during the peak hours the crews travel to/ from site, with deliveries occurring periodically throughout the day.

Table 12 Transmission line construction traffic volumes (localised area) – typical busiest day

Construction Item	Workforce traffic generation from camps			Deliveries/ Removing goods traffic generation			
	Light vehicles	Minibuses	Rigid trucks	Water trucks	Rigid trucks	Semi trailers/ truck and dog	B-doubles
Site Establishment, Civil and Earthworks	8	4	2	10	30	8	
Foundation Works	4		2	10	10	2	
Tower Assembly and Erection	18 (assembly)	4 (assembly)	4 (assembly)	10	10		8
Line Stringing	24	6	4	10	10	6	
Anti Climbing Device	6				10	4	
Rehabilitation	4				10	4	

Table 13 Transmission line construction traffic volumes (localised area) – typical busiest day

Construction Item	Workforce traffic generation from camps			Deliveries/ Removing goods traffic generation			
	Light vehicles	Minibuses	Rigid trucks	Water trucks	Rigid trucks	Semi trailers/ truck and dog	B-doubles
Site Establishment, Civil and Earthworks	4	2	1				
Foundation Works	2		1				
Tower Assembly and Erection	9 (assembly)	2 (assembly)	2 (assembly)				
Line Stringing	12	3	2				
Anti Climbing Device	3						
Rehabilitation	2						

Based on the construction program, roads and access routes which access a large number of towers may carry traffic for multiple construction stages.

Generally, the site establishment works occur well before other construction stages. For roads and access points that access few towers, this stage is likely to generate the highest traffic volumes.

Table 14 shows the overlap of crews on roads and at access points dependent on the number of towers the road or access services.

Table 14 Overlap of construction phases

No of towers being serviced by a road or access point	No. of crews on typical peak day				
	Site Establishment, Civil and Earthworks	Foundation Works	Tower Assembly and Erection	Line Stringing	Anti Climbing Device
1 tower	1				
5 towers	1				
10 towers		1	1		
20 towers		2	2		
50 towers		2	4	1	

Based on the above, the number of vehicle movements generated by overlap of construction stages for a peak day and a peak hour are shown in Table 15 and Table 16

Table 15 Construction traffic volumes on typical busiest day based on number of towers accessed

No of towers being serviced by a road or access point	No. of movements on typical peak day					
	Site Establishment, Civil and Earthworks	Foundation Works	Tower Assembly and Erection	Line Stringing	Anti Climbing Device	TOTAL
1 tower	62					62
5 towers	62					62
10 towers		28	54			82
20 towers		56	108			164
50 towers		56	216	60		332

Table 16 Construction traffic volumes at peak hour of typical busiest day based on the number of towers accessed

No of towers being serviced by a road or access point	No. of movements on typical peak hour					
	Site Establishment, Civil and Earthworks	Foundation Works	Tower Assembly and Erection	Line Stringing	Anti Climbing Device	TOTAL
1 tower	7					7
5 towers	7					7
10 towers		3	13			16
20 towers		6	26			32
50 towers		6	52	17		75

4.4 Substations

Flinders Substation is proposed to be located in the Flinders LGA.

4.4.1 Construction traffic information

4.4.1.1 Construction activities

Construction of the substations results in the following traffic generating activities:

- Site establishment (civil, earthworks)
- Platform construction
- Drainage, conduits and cable trench
- Earth grid
- Pavements
- Landscaping
- Civil
- Oil separator tank
- Helicopter pad
- Installation of modular buildings
- Common services building
- Electrical work.

4.4.1.2 Construction vehicles

The following vehicle types would be generated during the construction works:

- Vehicles from the camps
- Rigid delivery vehicles and semi-trailers and truck and dog vehicles for other materials (i.e. fill from quarries, waste removal, concrete trucks etc.)
- OSOM vehicles for the modular buildings and oversized electrical/ substation equipment.

4.4.1.3 Construction program

It is noted that the construction program is still fluid at the time of publishing this report due to the ongoing changes to the permanent design scope.

4.4.2 Construction traffic volumes

Table 17 shows the expected traffic volumes to be generated by a substation on the expected typical busiest day and Table 18 shows the expected traffic volumes to be generated by a substation during the peak hour of the expected typical busiest day. It is noted that during the peak hours the crews travel to/ from site, with deliveries occurring periodically throughout the day.

Table 17 Substation construction traffic volumes (localised area) – typical busiest day

Construction Item	Workforce traffic generation from camps			Deliveries/ Removing Goods Traffic Generation			
	Light vehicles	Minibuses	Rigid trucks	Water trucks	Rigid trucks	Semi trailers/ truck and dog	B-doubles
Site Establishment	12		2		10		
Roadworks	12		2		10	4	
Platform	12		2		10	12	
Drainage, Conduits and Cable trench	12		2		10		
Earth Grid	12		2		10		
Pavements	12		2		10	6	
Landscaping	12		2		10	2	

Construction Item	Workforce traffic generation from camps			Deliveries/ Removing Goods Traffic Generation			
	Light vehicles	Minibuses	Rigid trucks	Water trucks	Rigid trucks	Semi trailers/ truck and dog	B-doubles
Civil	12		2		10	4	
Oil tank	12		2		10	4	
Helicopter pad	12		2		10	4	
Installation of modular buildings	12		2		10	4	
Common Services Building	12		2		10	4	
Electrical work	8-16 (wiring)		2-4 (wiring)		10	4	

Table 18 Substation construction traffic volumes (localised area) – peak hour of typical busiest day

Construction Item	Workforce traffic generation from camps			Deliveries/ Removing Goods Traffic Generation			
	Light vehicles	Minibuses	Rigid trucks	Water trucks	Rigid trucks	Semi trailers/ truck and dog	B-doubles
Site Establishment	6		1		5		
Roadworks	6		1		5	2	
Platform	6		1		5	6	
Drainage, Conduits and Cable trench	6		1		5		
Earth Grid	6		1		5		
Pavements	6		1		5	3	
Landscaping	6		1		5	1	
Civil	6		1		5	2	
Oil separator tank	6		1		5	2	
Helicopter pad	6		1		5	2	
Installation of modular buildings	6		1		5	2	
Common Services Building	6		1		5	2	
Electrical work	4-8 (wiring)		1-2 (wiring)		5	2	

4.5 Cumulative traffic impact on FSC roads

Based on the assessment above, the expected traffic generation to each road during the busiest period of construction for that road is shown in Table 19. The table specifies the highest daily and peak hourly traffic generation, the period in which the volumes are expected to peak and the activities that result in the highest traffic generation to that road.

Table 19 Traffic generation to public roads

Road ID	Road	Expected highest daily traffic generation	Expected highest peak hour traffic generation	Expected busiest period	Activities resulting in highest traffic generation
7	Flinders Highway	Varies – up to 500	Varies – up to 200	Jun 2024-Sep 2028 (construction duration)	Overlap of: Transport of large items from Townsville Port to camps and transmission line Transmission line construction Substation construction Movements to/ from camps.
37	Aramac Torrens Creek Road	354	48	Jun-Sep 2025	Overlap of: Foundation works Tower assembly and erection Line stringing.
38	Cotonvale Road	216	23	Jun-Aug 2025	Overlap of: Foundation works Tower assembly and erection.
39	Prairie Road	216	48	Jun-Aug 2025	Overlap of: Foundation works Tower assembly and erection.
40	Woodbine Access	216	48	Jun-Aug 2025	Overlap of: Foundation works Tower assembly and erection.
41	Kennedy Energy Park Access Track	292	75	Jun-Sep 2025	Overlap of: Foundation works Tower assembly and erection Line stringing.
42	Redcliffe Road	134	23	Jun-Aug 2025	Overlap of: Foundation works Tower assembly and erection
44	Unnamed Road (off Flinders Highway at Hughenden - to Hughenden Camp)	460	195	Sep 2024-Jul 2026	Operation of Hughenden Camp Hub
45	Kennedy Developmental Road (south)	252	55	Apr-Jun 2026	Overlap of: Foundation works Tower assembly and erection.
46	Unnamed Road (off Flinders Highway - to PTL-FLR_284	436	95	Apr-Jul 2026	Overlap of: Foundation works Tower assembly and erection Line stringing.

Road ID	Road	Expected highest daily traffic generation	Expected highest peak hour traffic generation	Expected busiest period	Activities resulting in highest traffic generation
	to FLR-DJR_82)				
47	Thornhill Tamworth Road	216	33	Apr-Jun 2026	Overlap of: Foundation works Tower assembly and erection.
48	Marathon Stamford Road	124	14	May-Jun 2025	Site Establishment, Civil and Earthworks
49	Barabon Terranburby Road	176	52	May-Jul 2026	Overlap of: Foundation works Tower assembly and erection.

5. Traffic and road impacts during the operational and maintenance phase

Periodic inspections of the transmission lines will result in minimal traffic volumes, while the substations are anticipated to experience less than one vehicle per day during normal operations. Occasional light and heavy vehicle movements may occur during minor and major maintenance outages. Consequently, the traffic and road risks during the operation and maintenance phase are anticipated to be lower compared to the construction phase, primarily due to the substantially reduced traffic volumes.

5.1 Inspection and monitoring

There are several instances during the project's lifespan where additional monitoring will be necessary. These include maintaining vegetation to ensure adequate sight distances, ensuring proper upkeep of gravel roads, monitoring all roads for signs of deterioration, and reporting any crashes that occur.

5.1.1 Vegetation growth

During site investigations, it was noted that sight distances at intersections could be significantly improved through regular maintenance of surrounding vegetation. This maintenance entails grass cutting and/or removal of tree branches. It is advised that prior to the commencement of the construction phase, the relevant road authority is consulted to clear vegetation at identified locations with poor sight distances by the JV. Subsequently, these locations should be periodically inspected, and vegetation cleared as needed in collaboration with the road owner.

Once construction begins, the JV will conduct periodic checks. They should coordinate with the road owner to determine if their representative should be present during these inspections.

5.1.2 Road monitoring

Although the road defects identified during site investigations may be addressed before the project's construction phase begins, they provide insight into the overall condition of the roads and what challenges may arise during the project. None of the contacted councils have future works programs scheduled for the proposed project period, with works only planned one year in advance.

It is advisable to conduct a detailed dilapidation survey before construction begins. Areas of concern should be addressed and documented in consultation with the relevant road authority.

Continuous monitoring of access routes by construction drivers is recommended, with any deteriorating conditions reported in their daily driver records. Any specific issues should be closely monitored and addressed as needed. Additionally, periodic surveys by the construction contractor should be conducted to minimize the risk of drivers failing to report issues.

5.1.3 Gravel road maintenance

Many of the gravel roads inspected exhibited poor conditions characterized by rutting and potholes. The anticipated increase in heavy vehicle traffic on these roads will accelerate their degradation. Therefore, close monitoring of the gravel roads is essential to provide early warnings, allowing for timely intervention to prevent further damage to the pavement.

Before construction begins, it is advisable to assess all gravel roads along the access route for areas of poor condition and document them as part of a dilapidation survey. Any areas of significant concern should be addressed and documented in consultation with the relevant road authority.

Continuous monitoring of the gravel roads by drivers is recommended, with any deteriorating conditions reported in their daily records. Specific issues should be closely monitored and addressed promptly. Additionally, the contractor should conduct regular surveys to minimize the risk of issues going unreported by drivers.

5.1.4 Crash reporting

Crashes occurring along the project routes are to be promptly reported to both the relevant authorities and the responsible project personnel. It is imperative to investigate the potential causes of these accidents, and take appropriate actions, such as those outlined in this report (e.g., road maintenance, vegetation clearance, additional signage), where deemed necessary.

5.1.5 Construction worker driver consultation

Throughout the project's duration, it is essential to engage with both heavy and light vehicle drivers to gather any concerns they may have along the route. These drivers serve as valuable resources for monitoring conditions, as they can identify potential problem areas early on, which may require further assessment.

Additionally, drivers should receive regular briefings on risks or issues associated with specific sections of the route they will be traversing during their upcoming shift(s).

Furthermore, it is advisable to regularly consult with heavy and light vehicle drivers regarding any risks or issues concerning the access routes being utilised.

5.1.6 Post construction inspection

Inspections should be completed post construction in conjunction with the road owner. Remediation will be carried out in a timely manner post construction completion.

5.2 Road safety

Queensland Government's Queensland Globe has been utilised to investigate the most recent 10-year crash history (2013 to Mid-2021 – 2022 not available) along the Project route. All data along the proposed route was downloaded and analysed and is presented below in Table 20.

Table 20 Crash history - most recent 10-year period

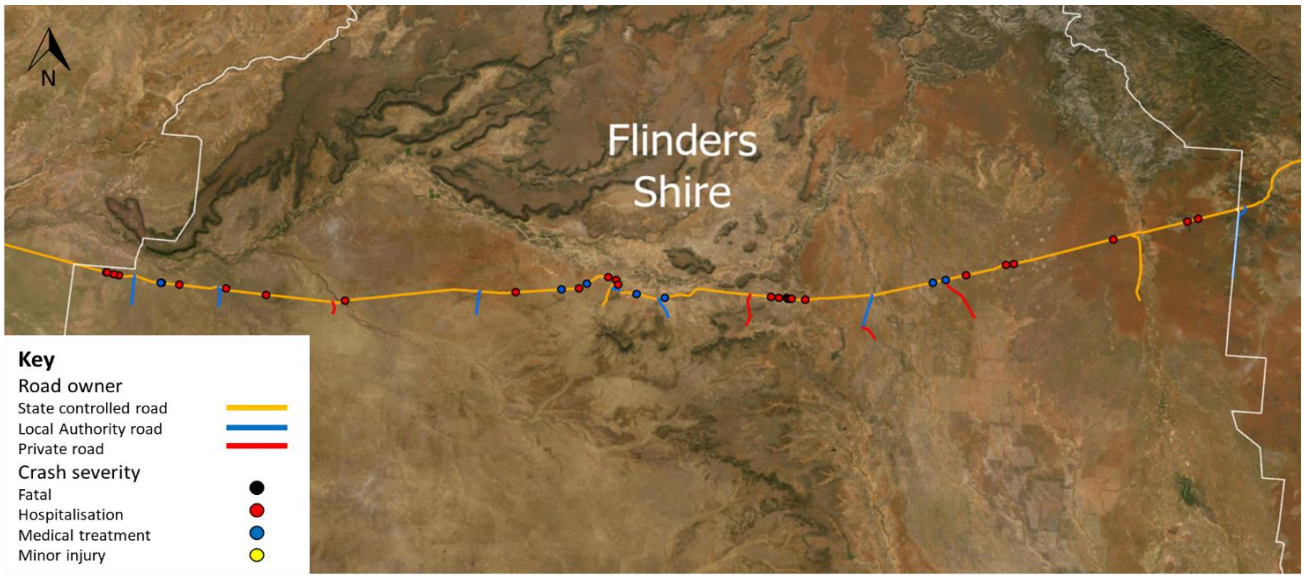
Location	Road owner	Roadway feature	Crash severity	Count	Prominent crash types
Flinders Highway	TMR	Midblock	Fatal - 1 Hospitalisation - 26 Medical treatment - 7 Minor injury - 1	35	Pedestrian - 1 Off path on straight - 26

Location	Road owner	Roadway feature	Crash severity	Count	Prominent crash types
Kennedy Developmental Road (south)	TMR	Midblock	Hospitalisation - 1	1	Pedestrian - 1

A total of 36 crashes were recorded along the Project route within the FSC region during the period from the start of 2013 to Mid-2021, all of which occurred on SC roads. There is no record of crash history data for the FSC roads in the last 10 years.

A map of crashes along the Project route during the period is shown below in Figure 8.

Figure 8 Crash history map



6. Indicative construction traffic management

A traffic management strategy has been prepared by the JV to define the traffic management measures and the associated staging that would be required to maintain a safe road network during the construction period in accordance with the CPB Safety Essential.

During the detailed design phase, site-specific TMPs and TGSs will be developed in alignment with the guidelines outlined in Austroads Guidelines for Temporary Traffic Management and current DTMR and nationwide standards. These plans will demonstrate how the safe movement of vehicles, cyclists, and pedestrians will be maintained while ensuring a safe working environment for workers. They will be established at the project's outset and continuously updated throughout construction, following agreed staging, to minimise disruptions for the travelling public.

The contractor will engage with FSC before and during construction activities. Additionally, FSC will issue the required permits, specifying conditions for lane changes, closures, and delivery of large equipment and materials.

Road works and deliveries of large items will be scheduled during off-peak periods or at night when traffic volumes are lower whenever possible.

At the time of preparing this CTMP, it was understood that Powerlink would directly oversee the upgrade of the FSC roads, with subsequent responsibility for traffic management falling to FSC. The CTMP will be reviewed and updated accordingly as further decisions regarding scope are made.