Chapter 20

Hazards, Health and Safety

20.0 Hazards, Health and Safety

This chapter describes the environmental conditions and values within the Draft Alignment and how hazards associated with the Project and local environment interact. Potential impacts from hazards are described and mitigation measures are provided to minimise the risk through the construction, operation and decommissioning phases of the Project.

The term hazards and risks are defined as follows.

- Hazards: A source of potential harm or an existing situation with a potential to cause loss, harm to people or damage to property and environment.
- Risks: The chance of something happening that will have an impact on objectives. A risk is often specified in terms of an event or circumstance and the consequences that may flow from it. Risk is measured in terms of a combination of the consequence of an event and its likelihood.

20.1 Scope

The study identifies the health, safety, and environment hazards and risks associated with all stages of the Project. The study addresses potential impacts to the environment and property, as well as the health and safety of the community. This chapter provides a preliminary risk identification for the Project, including:

- identification of potential project hazards (e.g. accidents, spillages, fire and abnormal events) during construction, operation and decommissioning
- identification of potential natural hazards (e.g. cyclone, flooding, bushfire, landslide) and the implications of climate change
- discussion of potential mitigation measures, including the development and implementation of an emergency management plan.

20.1.1 Assumptions and limitations

This study has been carried out based on information available at the time of preparation of the draft EAR, including research and information from the Project and technical team. Further investigation and development of design may lead to the identification of additional hazards and associated risks, or changes to the identified risks. The Project will continuously monitor the identified risks and conduct risk assessments to identify and assess emergent risks throughout the project lifecycle. Additional mitigation measures will be developed and documented throughout the Project as required.

The impacts of natural hazards on the Project discussed in this Chapter are based on existing and historical natural events. Where a chapter provides further detail of these natural hazards, a cross reference has been provided.

Emergency management response plans for the Project will be developed in accordance with Powerlink Queensland's Emergency Management Procedures and incorporated into the project Safety Management Plan. The Project emergency response plan discussed in this chapter is described based on existing information and capability of the emergency crew with regards to the possible emergency events that could occur during Project construction, operation and decommissioning.

20.2 Existing Environment

There are hazards and associated risks in the existing environment (in the absence of the Project), such as natural events and some infrastructure. Existing risks and hazards may potentially be increased by the Project and an understanding of these risks enables the Project's risk contribution to be analysed.

20.2.1 Natural events

Natural hazards exist as external risk influences on the Project. Key natural hazards identified for the project area include bush fire, flooding and landslides.

20.2.1.1 Bushfire

The Project area is predominately mapped as a 'Medium Potential Bushfire Intensity' Bushfire Prone Area (DSDMIP, 2018). Bushfire 'season', as described by Queensland Fire and Emergency Services, normally commences in North Queensland around July. The eastern extent of the Draft Alignment is identified as experiencing a peak in risk during spring while the remainder of the alignment experiences a bushfire season during winter and spring. The threat of bushfires increases with periods of reduced rainfall and increased temperatures, which can increase the amount of dry grass available to burn.

Chapter 5 Climate considered four Bureau of Meteorology (BoM) stations (Townsville Aero, Ingham Composite, Charters Towers Airport, Georgetown Post Office). The climate statistics from them show the highest recorded temperature for the Project corridor is +43.4°C (Ingham). Mean maximum temperatures values are highest at Georgetown in both winter (28.8°C) and summer (34.7°C). Mean rainfall values collected from the four BoM stations highlight the distinct wet (summer) and dry (winter) seasons experienced by the region, as well as the large variation in rainfall amounts received across the wider area.

Climate modelling from the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and BoM projects a temperature rise of 0.5 °C to 1.3°C and an ±10% rainfall changes by 2030 in the North Queensland region (full range of emission scenario).

The extreme heat and dry conditions experienced in the Project area, both now and in the future, can be conducive for a bushfire event. Bushfire is further discussed in Chapter 22 Bushfire Risk.

20.2.1.2 Flooding

The western extent of the draft transmission line alignment traverses the Gilbert River Basin for approximately 70km before crossing into the Burdekin River Basin. The alignment crosses 31 watercourses (third order stream (or higher)); 5 crossings occur in the Gilbert Basin and the remaining 26 crossings in the Burdekin River Basin. All watercourses crossed by the alignment are ephemeral and generally cease to flow shortly after the cessation of rainfall.

Approximate flood extents for the Project area were explained in Chapter 7 Hydrology. Flood extents for the Burdekin River for the 1% AEP are extensive and transmission lines will not be able to span this entire extent. Therefore transmission lines will be required to be installed in the Burdekin River floodplain. The Mount Fox substation and Copperfield River substation locations were found to have greater than 0.5% AEP flood immunity.

20.2.1.3 Cyclones

In Queensland, tropical cyclones mostly form from lows within the monsoon trough and affect the northern areas of the state (BoM, 2018). While relatively uncommon, these systems are generally formed during summer months and affect coastal areas most. Since the year 2000 there have been seven tropical cyclones of significance in Queensland, of which three would have hit the wider Project Area directly, at least on the eastern side. Cyclones are discussed further in Chapter 5 Climate.

20.2.1.4 Landslide

Landslides in Queensland are generally caused by heavy rain. The rain saturates the soil on a hillside—often where there has been human activity (e.g. construction where trees and plants have been removed)—past the point where any remaining vegetation can support the soil's weight against the force of gravity (Queensland Government, 2017).

The topography within the project area ranges from flat low lying land to steep crossings of multiple ranges and mountains, including part of the Pelican Range (70 km west of Mount Fox) and the Great Dividing Range (100 km west of Mount Fox) (Chapter 4 Land). The Great Dividing Range is identified as a landslide prone region (Geoscience Australia, 2018). Two landslides have been recorded at the Kangaroo Hills Homestead, approximately 6.5km south of the Project area, in 1911 and 1935 (Geoscience Australia, 2018).

20.2.2 Infrastructure

20.2.2.1 Road and rail

The Project area crosses a number State-controlled roads (managed by the Department of Transport and Main Roads) and local government roads (managed by Hinchinbrook Shire Council, Charters Tower Regional Council and Etheridge Shire Council). There is no operational rail infrastructure corridor within the Project area.

Roads within the Project area are used for heavy transportation of fuel and chemical trucks, school buses, ordinary motor vehicles and stock transport. Road routes can be interrupted from minor accidents of ordinary motor vehicles or interaction between wildlife. The major road interruption usually arises from vehicle carrying hazardous chemicals, and there is a risk of accidents occurring that could cause serious injury or death. Further information of road infrastructure is provided in Chapter 18 Transport and Traffic.

20.2.2.2 Existing high voltage line

Existing high voltage electricity infrastructure within the area includes an Ergon 66 kV transmission line that runs 90 km west from Mount Fox to Greenvale and another Ergon 132 kV transmission line that runs from Ross to Kidston. Co-location of the proposed 275kV line with this existing infrastructure is proposed between Mount Fox and Greenvale, and from the vicinity of Conjuboy to Kidston. Electric and magnetic fields (EMF) emitted from the existing and proposed infrastructure are explained in Chapter 21 Electric and Magnetic Fields.

20.2.3 Contaminated land

Ten lots within the Draft Alignment are listed on the EMR for a ‘notifiable activity’ (activities that have the potential to cause land contamination). The notifiable activities listed are associated with agricultural and mining activities. Land is listed on the EMR or contaminated land register (CLR) when the administering authority has been notified, or become aware, that notifiable activities are, or have been, carried out on the land. These activities, both present and past, have associated storage of pesticides, petroleum product, oil storage, mine waste and other chemicals within the study area. Therefore, there is the potential that contamination is present on lots within the Project corridor that are not listed on the EMR. Contaminated land is discussed further in Chapter 4 Land.

20.3 Risk Identification

20.3.1 Methodology

The approach identifies the risks associated with identified hazards. For health, hazards and safety, the approach takes into account the location of population centres, population densities and activities conducted within and around the development area. This provides a basis for the identification of risks and preparation of safeguards to manage and mitigate risks that might arise from the Project.

Risk identification comprises hazard identification and identification of the potential consequences of exposure to the hazard for sensitive receptors identified in the study area.

20.3.2 Risk Identification approach

The potential health, safety, and environmental hazards associated with high voltage electricity infrastructure have been identified. Sensitive receptors within the Draft Alignment that will potentially be exposed to hazards associated with Project have been identified through desktop study. Sensitive receptors identified are shown on Figure 3-1 and Figure 3-2.

Risk identification involves hazards and impacts identification. Risk treatment will then be applied to reduce the risk profile.

- Hazards and Identification: The risk identification phase identifies hazards and their potential sensitive receptors during the lifecycle of the project, including construction, operation and decommissioning. Receptors are not restricted to individuals or communities, and include sensitive environments such as land, water, flora and fauna.
- Risk Treatment: Mitigation measures, and safeguards will be established to minimise the risk to the community, property, and environment. All risks will be managed through Powerlink management plans and risk management framework and procedures. Consideration will be given to the full lifecycle of the Project including construction, operation and decommissioning of the substation and transmission line.

20.3.3 Data sources

Relevant data sets and sources for this assessment are provided in Table 20-1. This includes several relevant risk assessments and disaster management plans that have been undertaken by Hinchinbrook and Charters Towers Councils which are traversed by the Project. This draft EAR provides Project specific information regarding existing factors, potential impacts and proposed mitigation measures and have been referred to, where applicable, in this chapter.

Table 20-1 Data set and sources

Relevant Data	Sources
District Disaster Management Plan	Mareeba and Townsville
Local Disaster Management Plan	Charters Towers, Etheridge and Hinchinbrook
Planning Scheme	Etheridge Shire Council, Hinchinbrook Shire Council, Charters Towers Regional Council (Shire of Dalrymple)
EAR Chapters	Land, Climate, Flora, Fauna, Transport and Traffic, Water Management, Bushfire Risk, Waste Management
Powerlink Policies	Functional Policy for Substation Site Selection, Environmental Management Plans, Emergency Response Plan, Asset Management Strategy, Powerlink Homepage
Climate Data	Bureau of Meteorology

20.3.4 Preliminary Risk Identification

The risk identification presented in this section is a desktop study evaluating the key project risks. Technical studies undertaken as part of this EAR have been incorporated into this assessment where applicable.

This risk identification documents only **significant** or **high** risk interactions between the Project for the aspects of health, safety and environment during construction, operation and decommissioning.

The Project will comply with the *Electrical Safety Act 2002, Work Health and Safety Act 2011* (WHS Act) and Work Health and Safety Regulation 2011 (WHS Reg). For the purpose of the risk identification, the lifecycle of the Project is defined in the following phases:

- Construction – All activities up to the commencement of transmission line and substation commissioning

- Operation – All aspects from the commencement of commissioning through to, and including operation of the transmission line and substation
- Decommissioning – All activities associated with dismantling and removal of the infrastructure and environmental rehabilitation.

Some hazards are only found in a specific location within the Project corridor. Therefore the Project corridor has been divided into broad categories within which the characteristics and those of the surrounding environment are uniform (e.g. hilly terrain).

The key hazards and risks identified during the preparation of the preliminary risk assessment are presented in Table 20-2 (location specific) and Table 20-3 (non-location specific). The pre-mitigated risks are assessed at this stage and during detailed design the construction risk assessment will be undertaken to identify critical controls to mitigate risks and maintain residual risk to acceptable levels.

This preliminary risk assessment forms part of the larger risk management process which will continue throughout the lifecycle of the Project and has sought to identify hazards which may presently exist prior to construction. The Project will continuously monitor identified risks and conduct future risk assessments to identify and assess emergent risks throughout the Project lifecycle.

Table 20-2 Location Specific Hazards

Location	Hazards	Potential Health, Safety and Environmental Impacts
Agricultural and hilly terrain	Bushfire	• Damage to neighbouring infrastructure and properties • Transmission line structural failure and loss of service delivery • Potential for flammable goods to escalate risk of encroaching bushfire • Injuries or fatality
Hilly terrain	Landslide	• Instability of transmission tower and substation • Significant failure of infrastructure and service delivery • Change of construction plan • Injuries or fatality, e.g. struck by moving rocks
Kidston Mine	Contact with underground services	• Damage to underground infrastructure • Contamination to groundwater • Contact with live electricity with potential fatality
Kidston and Greenvale	Contaminated land/ Acid Sulphate Soils	• Excavation of contaminated land from sites listed on EMR/ CLR and further potential contamination, including landfill, petroleum oil storage • Contact with acid sulphate soils • Contamination to watercourses • Disposal of contaminated material and/ or on site remediation of contaminated soil
Water crossing	Flood	• Transmission line damage and loss of service delivery • Damage to electrical assets • Loss of access to infrastructure • Inundation of construction laydown areas
Greenvale and Kidston	Ergon 66kV and 132kV line	• Contact with overhead services • Inadvertent contact with overhead lines resulting in potential fatality

Location	Hazards	Potential Health, Safety and Environmental Impacts
Co-location with existing transmission line	Electric and Magnetic Fields	• Perceived health impacts • Induction on adjacent metal objects • Electrical shock or electrocution

Risk assessments which are common and are found to be present along the corridor regardless of the specific location are presented in Table 20-3.

Table 20-3 Non-Location Specific Hazards

Hazards	Life Cycle	Potential Health, Safety and Environmental Impacts
Spread of animal or plant disease (e.g. via vehicles and mobile plant and equipment)	Construction Operation (maintenance) Decommissioning	• Potential stock losses or quarantines impacts agricultural industry • Loss of biodiversity • Changes to irrigation requirements • Possible health hazards to animals
Waste (e.g. waste concrete, timber, plastic packaging)	Construction Decommissioning	• Offensive odour • Impact on visual amenity, e.g. temporary stockpile • Cross contamination of hazardous materials with general waste polluting soil
Sewerage	Construction Decommissioning	• Offensive odour • Pollution to watercourses • Increase nutrients and risk of disease in event of accidental release
Dangerous Goods and Hazardous Substance Storage and Handling	Construction Operation (maintenance) Decommissioning	• Loss of containment • Pollution to stormwater and soil • Potential fire from flammable goods

Hazards	Life Cycle	Potential Health, Safety and Environmental Impacts
		• Health impacts • Escalate the risk of bush fire
Dangerous Goods and Hazardous Substance Transportation	Construction Operation (maintenance) Decommissioning	• Loss of containment • Pollution to stormwater and soil • Potential fire from flammable goods • Escalate the risk of bushfire
Contact with high voltage electricity	Operation	• Injuries, e.g. cardiac arrest, electrical shock • Fatality
Overhead equipment and transmission line collision, e.g. Heli-stringing, overhead cranes, low flying helicopters patrols	Construction Operation Decommissioning	• Dropped loads • Injuries, e.g. fracture, concussion • Contact with live electricity • Fatality • Livestock loss • Property damage
Hot work and machinery use	Construction Operation (maintenance) Decommissioning	• Risk of fire or explosion from ignition of flammable contaminants. • Sparks act as catalyst for bush fire, live electricity near bushfire transmission line escalate the risk
Dust e.g. from roadworks, clearing of land, installation	Construction	• Poor visibility • Residential complaints • Respiratory irritation
Public vehicle interaction	Construction Decommissioning	• Injuries e.g. fractures, bruises, cut • Increase of traffic volume through local roads, traffic congestion • Increase in road wear

Hazards	Life Cycle	Potential Health, Safety and Environmental Impacts
Noise and vibration	Construction Decommissioning	• Nuisance and disturbance to residential
Fatigue	Construction Operation (maintenance) Decommissioning	• Public roads traffic accidents • Fatality
Vandalisms, e.g. security breach	Construction Operation Decommissioning	• Compromising infrastructure security • Contact with live electricity

20.4 Mitigation and Management Measures

Proposed controls will be considered during detailed design and through the construction risk assessment process. The controls will be based on existing Powerlink safety management systems. The management strategies practiced by Powerlink will be in place for the duration of the Project and are not limited to the control measures discussed in the draft EAR.

20.4.1 Natural hazards and environmental management plan

The Project corridor traverses potential bushfire, cyclone and landslide prone regions. The design and implementation of the Project has considered the impacts of potential natural hazards and will manage these hazards to minimise impact to the health, safety and environment to *so far as is reasonably practicable* (SFARP). The environmental values that have the potential to be impacted throughout the Project lifecycle will be managed in accordance with *Powerlink Standard Environmental Controls Specification* and relevant Australian Standards to ensure compliance with the legislative requirements, such as the *Environmental Protection Act 1994* (EP Act).

20.4.1.1 Bushfire

Powerlink has an established policy for bushfire management which will be applied throughout the Project lifecycle. Ground patrols are carried out to assess vegetation clearance and the condition of transmission lines and access tracks.

Vegetation around substation buffer zones and directly adjacent to security fencing is kept to a minimum. Based on growth rates or special requirements, Powerlink will remove unsafe vegetation as necessary, which can include the use of approved herbicides and removal or trimming of incompatible vegetation.

Monitoring of weather and identification of severe weather events in areas of operation will be carried out.

The design of the Project corridor will ensure adequate emergency service access. Consideration will be given to the provision for first response firefighting, accessible and sufficient water supply for firefighting purposes and the development of safe evacuation plans.

For further information, refer to Chapter 22 Bushfire Risk.

20.4.1.2 Flood and cyclones

The substations are required to be installed above the 0.5% AEP water level in accordance with the *Planning for stronger, more resilient electrical infrastructure guidelines*. Flood assessment, conducted in Chapter 7 Hydrology, show that both substations are above the 0.5% AEP flood envelope.

Powerlink transmission line structures are designed to span watercourses. Transmission lines will be set back from the bank of watercourses and drainage lines crossed by the alignment. Flood extents for the Burdekin River for the 1% AEP are extensive and transmission lines will not be able to span this entire extent. Therefore transmission lines will be required to be installed in the Burdekin River floodplain. The structures will aim to be sited outside of overland flow channels. Foundations are generally designed to AS7000:2010 (Overhead Line Design) and AS2159:2009 (Piling – design and installation). The transmission lines themselves will be designed to be well above large to rare flood levels.

The location of access tracks for construction and maintenance of the Project will avoid watercourse crossings where possible, and will be designed and constructed to avoid impeding surface water flow velocities and volumes.

For further information, refer to Chapter 4 Climate and Chapter 7 Hydrology.

20.4.1.3 Landslide

Landslides in Queensland are generally caused by heavy rain when rain saturates the soil on hilly terrain, and the Great Dividing Range of which the Project area traverses, has identified as a landslide prone region (Geoscience Australia, 2018).

The construction of tower structures will also consider a set back from the banks of watercourses to minimise risk to watercourses and potential erosion areas. Where new crossings of watercourses are required, the construction methodology will be dependent upon the size of the watercourse, however are generally developed in line with accepted development requirements for operational work that is constructing or raising waterway barrier works. The construction of bed-level crossings typically involves the excavation of the crossing bed tto an appropriate depth to provide a stable base. The excavation is then lined with a heavy duty geo-fabric, and filled with aggregate using a combination of rock sizes up to150mm to lock into the geo-fabric into place.

Clearing of land to accommodate the construction of the transmission lines structures will be avoided where possible to limit erosional impacts. The Project adheres to *Powerlink Functional Policy* for Substation Site Selection, with specific consideration for physical and topographical impacts including rocky and uneven terrain. *Powerlink Environmental Management Plan* sets the requirements for erosion and sediment control and the Project will ensure the performance criteria are met.

For further information, refer to Chapter 4 Land.

20.4.1.4 Biosecurity

The Project will adhere to *Powerlink Environmental Management Plan* and *Biosecurity Management Plan* will be developed to support construction and operation. The biosecurity practices comply with *Biosecurity Act 2014*. Regular easement inspections will be carried out to control the introduction or spread of identified weeds or pests on easement and access tracks. If maintenance work requires access to landholders' property, Powerlink will communicate with landholders and agreed upon the biosecurity management strategies, including the use of any chemicals to ensure ongoing effectiveness.

Additional controls such as vehicle wash down procedures for vehicles accessing properties and construction areas, identification of the origin of high risk construction machinery or equipment and implementation of weed monitoring during construction and operation will be carried out to identify any new incidences of weeds.

For further information, refer to Chapter 12 Biosecurity.

20.4.1.5 Waste management

The Project will comply with *Powerlink Environmental Management Plan* for Waste Management. During the construction, waste such as excess spoil, concrete, conductor drums, steel, cleared vegetation, plastic bags, food and sewage will be generated. These wastes will be recycled as much as possible. Waste materials that are known to attract vermin will be stored and handled in a hygienic manner prior to removal by a licensed waste contractor.

The Project is expected to produce relatively small quantities of hazardous (regulated) wastes such as hydrocarbons or hydrocarbon contaminated products (oily wastes and oil filters). These wastes will be disposed of by a licensed regulated waste transport contractor. Standard procedures will be developed in accordance with *AS1940:2017 Storage and Handling of Flammable and Combustible Liquids* requirements for the storage, containment, disposal and spill response for potentially hazardous waste materials.

For further information, refer to Chapter 23 Waste Management.

20.4.1.6 Noise and vibration

The requirements for managing noise and vibration arising from the Project are available in *Powerlink Environmental Management Plan*. The Project will ensure noise nuisance are reduced to SFARP and noise limit will be in accordance to the *Environmental Protection Act 1994*.

Machinery used will be maintained, repaired or replaced when it becomes noisier. Fuel powered equipment, including those used for grass cutting, impact tool, blowers, and generators will be shut down when not in use to minimise noise nuisance to surrounding sensitive receptors.

The location in which substation will be located will ensure sufficient setback to other land uses, specifically residential areas in accordance with the *Powerlink Functional Policy* for Substation Site Selection.

For further information, refer to Chapter 19 Noise and vibration.

20.4.1.7 Particulate and dust control

Speed limits will be imposed for unsealed, off road access tracks, specifically during dry and windy weather. Vehicles and equipment used will be fitted with appropriate exhaust systems and will be maintained in good working condition to minimise pollutant generation.

Powerlink Environmental Management Plan for Air Quality requires that watering of work areas and access tracks to be carried out during land clearing and major construction works to ensure particulate and dust are controlled to *Environmental Protection Act 1994* limits.

For further information, refer to Chapter 6 Air Quality.

20.4.1.8 Dangerous goods and hazardous substance management

The chemicals used during the construction, operation and decommissioning phases will include fuel (predominantly diesel), lubricants, oils, minor quantities of solvents and acids, degreasers and domestic cleaning agents.

The anticipated list of chemicals used throughout the lifecycle of the Project along with their purpose and dangerous goods details are presented in Table 20-4. The concentration of chemicals sourced from the supplier is not likely to be changed, however some chemicals will be provided as a concentrated solution for dilution prior to use. The quantities of chemical listed are not known at this level of design, however will be confirmed during the next phase of the design.

Table 20-4 Indicative list of dangerous goods and hazardous substance

Chemical Name	Design Life Cycle Stage	Purpose/ Use	DG Class	UN No.	PG
Concrete Curing Compound	Construction	Concreting for slab construction	N/A	N/A	N/A
Concrete retardant	Construction	Concreting for slab construction	N/A	N/A	N/A
Concrete residue	Construction	Concreting for slab construction	N/A	N/A	N/A
Kerosene	Construction	Fuel for mobile equipment	3	1223	III
Primer (solvent/glue)	Construction	Cleaning and degreaser	3	1206	II
Expanda Foam (fomofill)	Construction	Sealing of joints and gaps	2.1	1950	N/A
Silicon	Construction	Sealing of joints and gaps	4.1	1346	III
Aerosols paints	Construction	Line marking	2.1	1950	N/A
Alminox	Construction	Improve joint conductivity and prevent corrosion	N/A	N/A	N/A
Electrical contact cleaner	Construction Operation	Cleaning of grease from electric components	2.1	1950	N/A
Diesel Fuel	Construction Operation Decommissioning	Fuel for mobile equipment	3 (Class C1)	1202	III

Chemical Name	Design Life Cycle Stage	Purpose/ Use	DG Class	UN No.	PG
Lubrication oil (including grease and transformer oil)	Construction Operation Decommissioning	Lubricate equipment	Class C2	N/A	N/A
Sulphur Hexafluoride (SF 6) gas	Construction Operation	Transformer insulation	2.2, 6	1080	N/A
Herbicides	Construction Operation Decommissioning	Weed removal	N/A	N/A	N/A

20.4.1.9 Transportation of dangerous goods

The transportation of dangerous goods will only be undertaken by license transporters in accordance with *Australian Code for the Transport of Dangerous Goods by Road & Rail* (ADG Code), including the requirements to display Hazchem signage, placard and carry spill containment equipment to be used by emergency services personnel in the event of an emergency.

20.4.1.10 Dangerous goods and hazardous substance storage (permanent and temporary)

Powerlink Environmental Management Plan provides the general requirements for hazardous materials management, and includes performance criteria that there is no contamination of land or water as a result of a spill or release of hazardous material.

All chemicals will be stored, handled and used according to provisions in their Safety Data Sheet (SDS). SDS shall be made available for each chemical used and stored in an easily accessible location.

Standard procedures for the storage, containment, disposal and spill response for potentially hazardous materials will be managed in accordance with *AS 1940:2017 Storage and Handling of Flammable and Combustible Liquids* and *AS 3780:2008 Storage and Handling of Corrosive Substance*. The storage and handling, including first aid and clean up response of these chemicals will be incorporated into the Emergency Response Plan. Spill management requirements include:

- assess spill (extent and potential to migrate offsite, fire hazard potential, type and volume)
- isolate the spill (prevent further spillage, blocked drains and prevent access to the area)
- notification of the spill
- clean up and remediation
- restock spill kit.

20.4.2 Health and safety management

20.4.2.1 High voltage safety

High voltage electrical work will be managed to satisfy the requirements of the *Electrical Safety Act 2002* and subordinate legislation, including adherence to Powerlink's Electrical Safety Rules (ESR) and Safe Access to High Voltage Electrical Apparatus (SAHVEA).

Where community members wish to undertake work on or near a Powerlink transmission line easement, Powerlink provides guidance in their publication, *Powerlink Management of Easement Co-use Requests Guideline*, freely available on Powerlink's Website. It provides guidelines on activities which are generally permitted, require written approval or are not permitted.

Trespassing on or vandalisms of transmission towers or substations can result in severe or fatal injury. Substations are securely locked and monitored at all times. Powerlink is also committed to continued delivery of powerline safety messages to the community, through the 'Look up and Live' campaign,

electrical safety awareness activities and community engagement activities to increase public awareness of the powerlines and substation safety.

20.4.2.2 Collision with machinery or equipment

Heavy machinery used during construction includes excavators, graders, rollers, cranes, generators and drill rigs. The movement of heavy equipment presents risks arising from ground instability, equipment integrity failure or human error, with the potential to cause serious injuries. As such, the operation and maintenance of machinery will be in accordance with the manufacturer's specification, machinery maintenance and testing of breaking systems. Administrative controls include risk assessments, SWMSs/JSAs, Take 5, training of personnel and operation of machinery by competent authorised persons. Engineering controls will also be implemented, including exclusion zones where there is the potential to encroach high voltage exclusion zones or for tasks such as working at height.

Helicopter activities will be carried out for construction and maintenance of the project. This includes heli-stringing, insulator washing work, aerial inspection and patrols. The use of helicopters during construction, for cable stringing, lifting, placement or removal of transmission line, reduces the reliance on heavy equipment and road access. Nevertheless, risks associated with low flying helicopters will be managed, including through pilot responsibilities to maintain safe distance to residential premises, livestock, and towers.

20.4.2.3 Hot work

Activities which involve hot work have the potential to generate fires. The Project will ensure that a risk assessment process is in place in accordance with Powerlink's fire management principles to prevent outbreak of fire, including:

- limit hot work during extreme weather conditions
- availability of first response fire-fighting equipment and trained personnel
- adopt low fire risk infrastructure design
- develop strategies in planning, investigation and acquisition phase
- timely delivery of operational and maintenance strategies including regular inspections and vegetation maintenance.

20.4.2.4 Road safety

Vehicles used during construction and maintenance include graders, excavator and light vehicles that operate on roads and access roads around the Project corridor. Personnel operating these vehicles will be trained and authorised.

Traffic will be controlled by the provision of adequate crossing points, demarcation, signage and speed limits. Positive communication and give way in accordance to the Traffic Management Plan will be practiced to reduce risk of vehicular interactions. The Project will also apply for local authority (i.e. local Council) approval for works involving potential road closures or traffic delays to emergency services and the local community. Any temporary road closures will involve on site traffic management, so that in the event of emergency service vehicles needing to pass through the areas where stringing is occurring, passage will be provided. For further information, refer to Chapter 18 Transport and Traffic.

20.4.2.5 Fatigue management

Powerlink Fatigue Management Guidelines are used to ensure conditions of work of personnel align with *Work Health and Safety Act 2011*. Random breath testing and drug and alcohol test will be carried out to identify fitness for work to reduce the likelihood of related incidents.

20.4.2.6 Underground services

Facility records will be used and visual inspection will be conducted to gather site information to identify any hazards, soil conditions, trenches, pits, bores, standing water and potentially dangerous obstruction which may impact on safe execution of work. The Project will lodge a *Dial Before You Dig* enquiry prior to excavation or drilling work, which provides information about underground services on the worksite. Excavation work will be carried out according to Project work plans and any excavations,

including exposed underground assets, will be backfilled. Procedural control for the Project will also ensure that excavation work will comply with *Safe Work Australia Model Code of Practice*.

20.4.2.7 Electromagnetic fields

EMFs are found where electricity or electrical equipment is being used. Technical assessment confirmed that co-location of the project with the existing transmission line is below the guideline limit published by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). Although there is no scientifically proven causal link between EMFs from transmission lines and human health, the Project nevertheless will follow 'prudent avoidance' approach in the design and siting of transmission lines and substations.

Powerlink has adopted the policy of prudent avoidance with regards to EMF, such as assisting the community experiencing television or radio reception problems caused by transmission line by providing advice and, if required, signal amplification equipment. Where the possibility that a transmission line could cause interference with the operation of an electric fence running parallel to the line, Powerlink will provide mitigation measures to assist the owner of any electric fence installation that might be adversely affected. For further information, refer to Chapter 21 Electric and Magnetic Fields.

20.4.3 Emergency Response Plan

20.4.3.1 Emergency response

The Project will adhere to Powerlink's Emergency Preparedness and Response Procedure, focusing on the following:

- first aid capability
- fire protection capability
- security systems capability
- remote travel emergency response capability.

The testing of emergency procedures will be conducted at scheduled intervals to test the effectiveness of Powerlink's preparedness and response. Emergency procedure testing will involve desktop scenarios and procedural tests, through to complete organisation-wide drills involving emergency services, dependent on relevant emergency risk potential.

The Charters Towers, Etheridge Shire and Hinchinbrook Shire Local Disaster Management Plans will be considered when preparing the project specific Emergency Response Plan (ERP) in accordance with Powerlink's Emergency Management Plan. Etheridge Shire and Hinchinbrook Shire Local Disaster Management Groups will also be contacted for consultation and will be notified on the schedule and activities of the Project. Consultation will also occur with the local emergency services (SES, QPS, QAS and QFRS) to ensure that external support will be provided by these services in an event of an emergency.

Necessary resources will be available to ensure timely provision of first aid by trained competent staff, appropriate fit-for-use first aid facilities and access to medical and allied health support as per the ERP. This is achieved by having appropriate, compliant and maintained first aid equipment, consumables, trained personnel, facilities, and medical support.

Competency of personnel for roles in emergency response will be ensured through competency training.

An appropriately trained Emergency Management Team will be available to manage threats such as large scale natural disasters such as cyclones, bushfire, or large scale flooding. Project risks involving medical emergencies, including electric shock, burn, height rescue, snake and insect bites, hazardous chemical spill and threats will be managed in accordance to the ERP.

First Aid Officers and Fire Wardens will be visibly identifiable on site to assist in the ready identification of trained personnel in the case of an emergency. Firefighting capabilities, including warning, communication and evacuation, will be addressed in the ERP.

20.4.3.2 Emergency planning

The Project will adhere to Powerlink's ERP to manage emergencies. Where sources of emergency and disruption are foreseeable, preparedness and response will be based on the following components:

- a structured approach for incident assessment, escalation and response
- appropriate and timely emergency management decision making
- the availability of trained and capable response personnel
- the provision of necessary equipment and resources that are readily available to minimise any adverse impact on the health and safety of people or operations.