Appendix J RoL assessment memo

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ATTN: Cameron Adams
33 Harold Street
Virginia, QLD
4014

COPPERSTRING 2032 STAGE 1 OFFSET: OFFSET AREA RISK OF LOSS – SPATIAL ANALYSIS

Introduction

E2M Pty Ltd (E2M) has been commissioned by Powerlink Queensland (Powerlink) to identify suitable offsets to acquit the CopperString 2032 Project, (herein referred to as 'the project') offsets obligations under the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offset Policy* (herein referred to as 'the policy'). In accordance with the policy, the project's ability to acquit its offset obligations was determined using the Department of Climate Change, Energy, the Environment and Water (DCCEEW) Offsets Assessment Guide.

An integral variable in the Offsets Assessment Guide is the *Risk of Loss* percentage. *Risk of Loss* is identified by the DCCEEW as the "*the chance that the habitat on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future*" (DCCEW, 2023)

Based on E2M's experience DCCEEW base their *Risk of Loss* on the "*Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act*" document (herein referred to as 'the guidance document') (National Environmental Science Programme, 2017). The guidance document outlines a proposed methodology for calculating the background rate of loss that can be used to estimate *Risk of Loss*. This background rate of loss is calculated using:

- remote sensing (Landsat imagery)
- the national land use dataset (Australian Bureau of Agricultural and Resource Economics, 2010); and
- local government areas (LGA), where each LGA is given a rate of loss.

The project is located within is the McKinlay Shire Council(MSC) LGA. The guidance document prescribes a *Risk of Loss* value of 1.1% for the MSC LGA (itemised in Appendix 1 of the guidance document). E2M has noted that the proposed offset site is located on a secondary land use category of 'Grazing native vegetation' and as such, E2M is of the opinion that the prescribed *Risk of Loss* value of 1.1% nominated in the guidance document does not accurately represent the *Risk of Loss* across the proposed offset site.

Approximately 99.99% of the proposed offset area is Category B regulated vegetation with the remaining 0.01% Category X.

Aim

The aim of this document is to demonstrate that the revised *Risk of Loss* methodology prescribed in this document is robust and provides a more accurate representation of the *Risk of Loss* within the offset site, compared to the 0% presented in the guidance document.

The guidance document *Risk of Loss* Methodology

The guidance document outlines the method to creating a background rate of loss as follows:

- Determine forest extent (primary vegetation) in 1972 using Landsat imagery
- Determine where regrowth occurred and exclude regrowth from calculations
- Determine the amount of primary vegetation cleared for each year
- Divide data into LGAs across Australia
- Calculate the background rate of loss as primary vegetation cleared/total amount of primary vegetation within that LGA per year; and
- Determine the average background rate of loss across the 10 years (2005-2014) and multiply this by 20 to get the 20 year *Risk of Loss* (National Environmental Science Programme, 2017).

E2M adapted *Risk of Loss* Methodology

Specific to Queensland, the Department of Environment and Science (DES) captures woody vegetation clearing and woody extent mapping annually through 'The Statewide Landcover and Trees Study' (SLATS) reporting mechanism (DES, 2018, 2022). The SLATS process was modified in 2017 to allow for the use of higher-resolution satellite imagery and for creation of new SLATS products. A high-level overview of current process is outlined below:

- Satellite data from Landsat TM, ETM+ and OLI, Sentinel-2A and -2B, and DMC-3 TripleSat (Earth-i) is acquired. All imagery is geometrically and radiometrically corrected by the provider or is further corrected by DES to meet internal standards (Department of Environment and Science (DES), 2022).
- A woody vegetation extent dataset is developed to form the baseline for woody vegetation change accounting within SLATS which then can also be used for other applications requiring detailed woody extent mapping (DES, 2022). The initial data set is created using a Convolutional Neural Network (CNN) classification and high-resolution satellite imagery from 2017 (DES, 2022).
- SLATS scientists manually refined and updated the data set based on clearing data and subsequent satellite imagery (DES, 2022). The resulting woody vegetation map from 2018 became the baseline for SLATS' monitoring, accounting, and reporting (DES, 2022). At the end of each annual monitoring period, the woody extent is further updated using SLATS clearing and regrowth mapping for that period (DES, 2022).
- A woody vegetation clearing dataset is required by the Queensland Government to track clearing and inform decision making across various agencies (DES, 2022). The previous mapping method involved comparing two dry season Landsat images taken about twelve months apart (DES, 2022). It included generating a woody vegetation clearing index to identify potential clearing and manually refining the detections for accuracy (DES, 2022). Although the two-date method still applies to Sentinel-2 imagery, adjustments were made to accommodate differences between Landsat and Sentinel-2 data (DES, 2022). These modifications include adapting the clearing index and refining the manual interpretation process, considering factors such as resolution, radiometrics, length of time series, and the explicit incorporation of woody vegetation extent data (DES, 2022).

- All data products produced by SLATS go through a rigorous post-processing process to improve overall accuracy of the products. Post-processing processes include: manual editing, in-house peer review, re-modelling, field data capture and moderation of clearing tiles by senior DES remote sensing scientists.

The SLATS methodology has been subject to international peer-review and publication in scientific journals or conferences (DES, 2018, 2022). This rigour has resulted in the methodology being adapted and endorsed by other states and territories in Australia (Queensland Government, 2022).

Due to the rigour of this process, the SLATS data was incorporated into the analysis rather than re-analyse the Landsat imagery as per the guidance document. This decision resulted in change to methodology, such that the guidance document method was used to guide this updated process.

The guidance document utilised the national land use dataset (Australian Bureau of Agricultural and Resource Economics, 2010). However, due to the currency of this data, it was decided to use more recent Queensland Land Use Mapping Program (QLUMP) data. QLUMP is part of the Australian Collaborative Land Use and Management (ACLUMP), which is coordinated by ABARES, which published the national dataset in 2010.

The datasets used in this analysis were:

- SLATS reporting data from 2003-2022;
- Vegetation management regulated vegetation management map - version 7.07
- Central Highlands Regional Council boundary;
- Statewide Landcover And Trees Study (SLATS) Sentinel-2 - 2022 woody vegetation extent;
- Biodiversity status of 2003 remnant regional ecosystems - Queensland; and
- Queensland Land Use Mapping Program (QLUMP) data for the Desert Channels (2016), Northern Gulf (2015) and Southern Gulf (2015).

All the datasets were downloaded from the Queensland Spatial Catalogue and are available to the public.

The process for creating the background rate of loss and Risk of Loss is outlined below:

- Create a 2003 woody vegetation baseline. Combine the 'Statewide Landcover And Trees Study (SLATS) Sentinel-2 - 2022 woody vegetation extent' with the SLATS clearing data from 2003 – 2022 (excluding natural causes of clearing e.g. natural disasters, natural tree death). The woody vegetation baseline was then intersected with the Biodiversity status of 2003 remnant regional ecosystem layer to define what woody vegetation was remnant and non-remnant.
- Create combined clearing dataset. The 2003-2022 SLATS datasets were merged to create a combined clearing dataset, with natural causes of clearing removed. This combined clearing dataset was then dissolved to remove any duplicate geometries.
- Create merged QLUMP dataset that covers the current MSC LGA. The three QLUMP datasets identified above were combined to create a single land use dataset, with all the secondary land uses merged. All secondary classes except for land uses related to grazing native vegetation and marsh/wetland were removed.
- Create 'background rate of loss' using combined dataset of Land use mapping, woody vegetation baseline (2003) and combined clearing dataset. This dataset represented the total effect of clearing in grazing native vegetation from 2003-2022 across MSC. The risk of loss for remnant and non-remnant areas was calculated and then applied to the current non-remnant/remnant regulated vegetation breakdown on the proposed offset area.

Risk of Loss Analysis

The analysis of the current MSC background rate of loss dataset is represented in Table 1 (Grazing Native Vegetation) a Table 2 (Marsh/Wetland).

Table 1: Grazing Native Vegetation Woody Vegetation 2003 - 2022

Council	Remnant Vegetation 2003 (ha)	Remnant Vegetation 2022 (ha)	2003 - 2022 Remnant Vegetation Clearing (ha)	Risk of Loss (2003 - 2022)
McKinlay Shire Council Total	3,856,878.08	3,850,621.55	6,256.53	**0.16%**

Table 2: Marsh/Wetland Woody Vegetation 2003 - 2022

Council	Remnant Vegetation 2003 (ha)	Remnant Vegetation 2023 (ha)	2003 - 2022 Remnant Vegetation Clearing (ha)	Risk of Loss (2003 - 2022)
McKinlay Shire Council Total	120,702.73	120,462.31	240.42	**0.2%**

To provide an accurate Risk of Loss for the offset site, the two Risk of Loss values were weighted using the percentage of grazing native vegetation (86%) and marsh/wetland (14%) vegetation across the proposed offset site. This resulted in a final Risk of Loss of 0.167%, this is an increase of 0.167% from the original calculation (0%) provided in Appendix 1 of the guidance document.

Conclusion / Recommendation

This assessment concluded that the background rate of loss used in the guidance document is an underestimation for the offset site. Based on the analysis undertaken as part of this assessment an accurate *Risk of Loss* for the project is considered to be 0.167%.

If you have any queries regarding this advice, please contact me on 0419 333 469.

Kind Regards,

Cameron Davey
Chief Commercial Officer

References

Australian Bureau of Agricultural and Resource Economics. (2010). *Land Use of Australia, Version 4, 2005/2006*.

Department of Climate Change, Energy, the Environment and Water. (2023). *How to use the Offsets Assessment Guide*. Commonwealth of Australia.

Department of Environment and Science. (2018). *Statewide landcover and trees study (SLATS): Overview of methods*. Queensland Government.

Department of Environment and Science (DES). (2022). *Statewide Landcover and Trees Study Methodology Overview v1.1*.

National Environmental Science Programme. (2017). *Guide for deriving 'Risk of Loss" estimates when evaluating biodiversity offset proposals under the EPBC Act*.

Queensland Government. (2022). *SLATS explained*. https://www.qld.gov.au/environment/land/management/mapping/statewide-monitoring/slats/slats-explained