2019

Mt Piper Power Station

Biodiversity Offset Management Plan

Lamberts North Ash Placement Project

EnergyAustralia

Inside Cover Photo: Northern view across the Biodiversity Offset Area towards the Thompson Creek Reservoir dam wall (Credit: EnergyAustraliaNSW, 2019)

Document Control Table

Version	Issue Date	Approved Date	Approval Agency	Review Team	Review Summary
1.0	23/07/2015	24/08/2015	NSW Department of Planning and Environment	N/A	N/A
2.0	23/09/2019	18/12/2019	NSW Department of Planning, Industry and Environment	Antony Nolan (EnergyAustralia NSW), Elise Keane, Kalya Abbey, Rachel Murray, Bec Croake and Tom Kelly (Eco Logical Australia)	Respond to DPE (now DPIE) comments, update relevant sections and figures

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1 INTRODUCTION

1.1 Background

On 16 February 2012, Delta Electricity (now EnergyAustraliaNSW) received Project Approval (09_0186) under delegation from the Minister of Planning for the Mt Piper Ash Placement Project (the Project) under Section 75J - *Environmental Planning and Assessment Act 1979* to permit the continued disposal of ash generated by the Mt Piper Power Station. The Project Approval was granted subject to the Conditions of Approval (CoA).

Subsequent to the Project Approval, Delta Electricity proposed to increase the area of ash placement within the Lamberts North site (SKM, 2012).

The project as presented to the (former) NSW Department of Planning and Environment (DPE) was essentially divided into two parts; Lamberts North and Lamberts South, with the two phases of the project separated geographically (see Figure 1 and Figure 2) and by a significant period of time.

The consistency review (SKM, 2012) was approved by DPE on the 11 January 2013 and required the preparation of a Biodiversity Offset Management Plan (BOMP) for Lamberts North and a separate Biodiversity Offset Strategy Outline (BOSO) for Lamberts South. The BOSO for Lamberts South was prepared as a separate document and approved by DPE in May 2014 (Delta Electricity, 2013). EnergyAustraliaNSW has suspended plans for ash placement at Lamberts South while the area is being used for coal mining operations and have indicated that it is highly unlikely to ever access Lamberts South.

This document has been prepared to address Condition B6 of PA 09_0186 and the subsequent amendment - Biodiversity Offset Management Plan for Lamberts North only. As PA 09_0186 relates to both Lamberts North and Lamberts South, not all components of Condition B6 are applicable to Lamberts North and this BOMP.

The Environmental Assessment for the Project (SKM, 2010) determined the proposed ash placement at Lamberts North would impact on 5 ha of rehabilitating vegetation from areas subject to former coal mining activities. At the time of the assessment (SKM, 2010), this vegetation was estimated to be less than ten years of age and did not form part of the offset calculation in the Environmental Assessment (SKM, 2010). Further to this, it was found that due to past disturbances from open-cut mining and the minimal extent and early stage of rehabilitation, the Lamberts North site has been independently assessed as being devoid of ecological attributes (CDM Smith, 2012).

Despite this, EnergyAustraliaNSW committed to the rehabilitation of Lamberts North and offsetting of an alternative site in the vicinity of Lamberts North. Through discussion with DPI (2013) it was agreed that an offset ratio of 1:1 was suitable (see Appendix A; DPI, 2013).

This BOMP focuses on a 6.8 ha site located at Thompsons Creek Reservoir which is proposed to be rehabilitated and used as a biodiversity offset area (BOA) for Lamberts North. This plan details the location, baseline environment, management strategies to be implemented, along with the monitoring, performance and contingency requirements to track the progress of the BOA towards meeting its completion criteria.

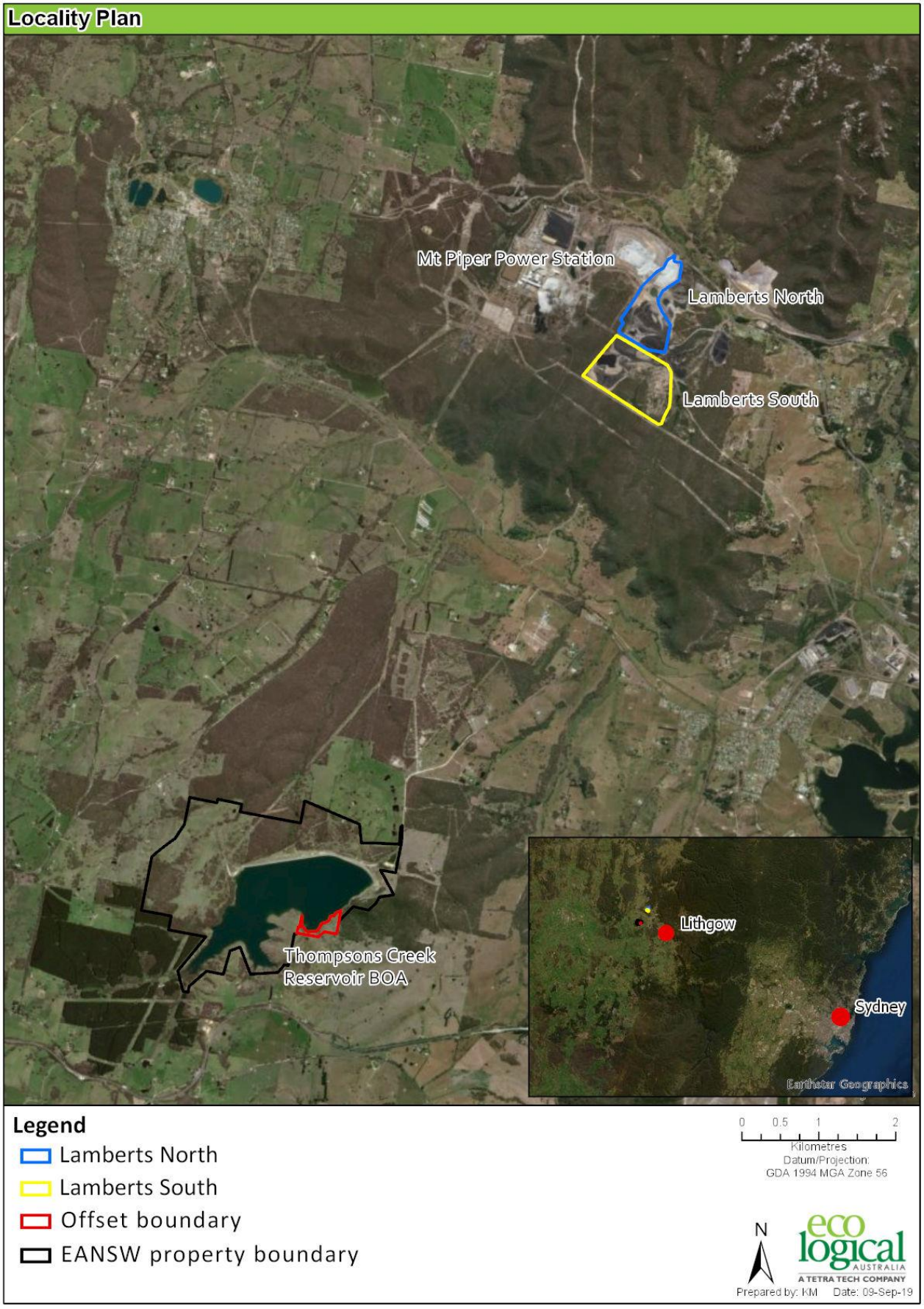

Figure 1: Locality Plan

Figure 2: Mt Piper Power Station Ash Placement Project Approval Boundaries

1.2 Purpose

The Thompsons Creek Reservoir BOA (hereafter referred to as the BOA) addresses the requirement to offset the ash placement works within Lamberts North, primarily the removal of 5 ha of rehabilitating native vegetation. The management and protection of the BOA is intended to secure, maintain and enhance its ecological values.

The purpose of this BOMP is to:

- Provide background on the Lamberts North ash placement project and the requirement for offsetting
- Identify the objectives and outcomes to be met by establishing the BOA
- Describe the suitability of the BOA, including its baseline conditions
- Detail the management strategies to be undertaken within the BOA to secure, maintain and enhance its ecological values in perpetuity
- Detail performance criteria to measure the success of management strategies, along with contingency measures to be implemented, should monitoring indicate that biodiversity outcomes are not being achieved.

1.3 Objectives

The overall objective of this BOMP is to provide a clear and concise management plan for the BOA detailing the methodology, management and monitoring requirements to establish a native woodland with flora species compatible with the surrounding native vegetation communities.

Specific objectives of the BOA and the biodiversity outcomes to be achieved are to:

- Revegetate the BOA to a native woodland reflective of the surrounding area
- Long-term re-establishment of fauna habitat for a range of native species
- Manage weeds and feral animals so that they do not pose a risk to revegetation
- Establish an inspection, monitoring and review program to track progression of the BOA
- Secure the BOA in perpetuity.

Objective 1: Revegetate the BOA to a native woodland reflective of the surrounding area

This objective will be achieved through:

- Ensuring species mix for revegetation is consistent with the Plant Community Types (PCTs) surrounding the BOA
    - The PCTs of the surrounding landscape have been identified and are characterised by Apple Box (*Eucalyptus bridgesiana*), Brittle Gum (*Eucalyptus mannifera*), Broad-leaved Peppermint (*Eucalyptus dives*), Long-leaved Box (*Eucalyptus goniocalyx*), Red Stringybark (*Eucalyptus macrorhyncha*), Ribbon Gum (*Eucalyptus viminalis*) and Snow Gum (*Eucalyptus pauciflora*). These species should form the basis of

revegetation works. Where possible seed is to be collected from the local area, allowing for a synergy between seed collection and seed selection, which is more likely to result in successful revegetation.

- Density of revegetation (stems per ha) is consistent with surrounding PCTs
    - The PCTs of the surrounding area are in the form of open woodland / forest. Whilst no specific benchmarks are available for stem densities for PCTs, key references were consulted which refer to stem densities of 30-40 stems/ha in open woodland in south-eastern Australia (McIntyre, 2002; Kerle, 2005; Gibbons *et al*, 2010). Given that not all revegetated trees will reach maturity, a factor of four was applied to result in a target stem density of 160 stems/ha, which is consistent with the rates of successful establishment recorded previously within the BOA (ELA, 2018).

Objective 2: Long-term re-establishment of fauna habitat for a range of native fauna species

This objective will be achieved through:

- Revegetation to a native woodland reflective of the surrounding area
    - The re-establishment to a native woodland using species present within the surrounding area, will provide habitat for a range of fauna species, including various threatened woodland fauna recorded in the surrounding area. Revegetation will also enhance habitat connectivity in the local area, providing further benefits to native fauna species.

Objective 3: Manage weeds and pest animals so that they do not pose a risk to revegetation

This objective will be achieved through:

- Exclusion of pest animals and listed weed species and control of grazing pressures
    - Fencing around the BOA has been established and will be maintained to exclude pest animals from adjacent properties. Appropriate planting guards will also be considered around revegetation works to further exclude pest and native herbivores.
- Biannual weed and pest animal inspection
- Biennial weed and pest animal monitoring
- Weed control and pest animal control (as required).

Objective 4: Establish an inspection, monitoring and review program to track progression of the BOA

This objective will be achieved through:

- Establishing a baseline and ongoing ecological monitoring program
    - Baseline ecological monitoring was undertaken in summer 2016 and follow up monitoring was undertaken in spring 2018. Subsequent monitoring will be completed biennially (every two years) by qualified and licensed ecologists with findings and recommendations reported to EnergyAustraliaNSW.

- Undertaking routine inspections
    - EnergyAustraliaNSW will complete biannual inspections. Inspections will cover weed and pest animal management, as well as maintenance aspects of the BOA, such as fencing and access.

Objective 5: Secure offset in perpetuity

This objective will be achieved through:

- Engaging with the NSW Department of Planning, Industry and Environment (DPIE) (formerly OEH) and the Biodiversity Conservation Trust (BCT) to determine the most appropriate means of securing the BOA.
- Development of a binding agreement to provide for the management and security of the BOA in perpetuity.

1.4 Regulatory Requirements

This BOMP has been prepared to satisfy relevant conditions of the Project Approval 09_0186 granted under Section 75J - *Environmental Planning and Assessment Act 1979*. Specifically, this plan addresses Schedule 2 Condition B6 of the Project Approval which relates to the Lamberts North ash placement.

Conditions of Approval relating to Lamberts South, such as those in condition B6 (c), are not addressed in this report and have been addressed in the Biodiversity Offset Strategy Outline for Lamberts South, that was approved by DPE in May 2014 (Delta Electricity, 2013).

The relevant approval conditions, statement of commitments, and a section reference for where each item of the conditions is addressed within this plan are provided below in Table 1.

EnergyAustraliaNSW seeks to secure the proposed Thompsons Creek Reservoir BOA in accordance with Division 3 of the NSW *Biodiversity Conservation Act 2016*.

Legislation relevant to this BMP includes:

- *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
- *Biodiversity Conservation Act 2016* (NSW)
- *Environmental Planning and Assessment Act 1979* (NSW)
- *Biosecurity Act 2015* (NSW)
- *National Parks and Wildlife Act 1974* (NSW)
- *Protection of the Environmental Operations Act 1997* (NSW)
- *Water Management Act 2000* (NSW).

1.5 Impact Assessment for Lamberts North

The majority of the Lamberts North ash placement area is comprised of highly disturbed land currently used for mining activities, along with rehabilitated landforms devoid of vegetation, where

mining has ceased. A small area of rehabilitated vegetation 5 ha in area, forms part of the Lamberts North ash placement area. This vegetation is estimated to be less than ten years of age and is comprised of multiple Wattle species, with various Eucalypts also interspersed.

Within this area, the vegetation takes the form of sparsely distributed seedlings and low shrubs, with the exception of two narrow strips of older, more established revegetation. This 5 ha area is the only vegetation to be impacted at Lamberts North. At the conclusion of ash placement works, the area will be systematically rehabilitated with locally suitable native vegetation, where considered practicable.

The Environmental Assessment (SKM, 2010) indicated that the modified lands of Lamberts North have no conservation value and as such, there were no direct or indirect impacts to biodiversity resulting from the ash placement works associated with Lamberts North.

The Lamberts North ash placement area did not form part of the offset calculation for the broader Mt Piper Power Station ash placement project, which was in accordance with correspondence from the (former) NSW Office of Environment and Heritage (OEH) (now DPIE) (see Appendix A; OEH, 2013). Rather, a 1:1 offset ratio within the vicinity of Lamberts North was agreed to as an appropriate offset for the 5 ha of rehabilitated vegetation to be removed (see Appendix A; DPI, 2013).

Table 1: Approval Conditions

Condition	Condition requirement - Biodiversity Offset Management Plan	Section
B6	The Proponent shall develop and submit for the approval of the Director-General, a Biodiversity Offset Management Plan. The Biodiversity Offset Management Plan is to be submitted within 12 months of the project approval, unless otherwise agreed to by the Director-General. The Plan shall be developed in consultation with the EPA and shall:	N/A
a	identify the objectives and outcomes to be met by the Biodiversity Offset Management Plan	Section 1.2, Section 1.3
b	describe the size and quality of the habitat/vegetation communities of the offset	Section 2.1, Section 2.4
c	identify biodiversity impacts, including impacts related to the loss of impacted flora and fauna including threatened Capertee Stringybark (Eucalyptus cannonii), nine (9) hectares of remnant vegetation (including, Red Stringy Bark Woodland, Scribbly Gum Woodland, Ribbon Gum Woodland), habitat for microbat and woodland bird species and the 31 ha of rehabilitated vegetation to be removed	Section 1.5
d	describe the decision-making framework used in selecting the priority ranking of compensatory habitat options available in the region. Where possible, this should include purchase of land, development of agreements with identified land management authorities (e.g. EPA, local Council) for long term management and funding of offsets and mitigation measures, and installation of identified mitigation measures	Section 1.1, Section 1.6, Section 2.1, Section 2.2
e	include an offset for direct and indirect impacts of the proposal which maintains or improves biodiversity values	Section 1.5, Section 2.1, Section 2.2
f	identify the mechanisms for securing the biodiversity values of the offset measures in perpetuity and identify a monitoring regime, responsibilities, timeframes and performance criteria; and	Section 2.3, Section 3.9, Section 4
g	detail contingency measures to be undertaken should monitoring against performance criteria indicate that the offset / rehabilitation measures have not achieved performance outcomes. Rehabilitation measures are required to be implemented to ensure that the biodiversity impacts are consistent with a maintain or improve biodiversity outcome.	Section 5

1.6 Stakeholder Consultation

1.6.1 Regulatory Consultation

This Management Plan has been prepared in consultation with DPIE and relevant correspondence is included in **Appendix A**. This Management Plan will be reviewed and approved by DPIE (North West).

Correspondence from regulatory agencies with respect to review, feedback and approval of the BOMP is included in **Appendix A**, including initial DPI approvals of the BOMP, dated 24 August 2015.

OEH (now DPIE) provided feedback in 2013 which was incorporated in the 2013 version of the Lamberts North BOMP and Lamberts South Biodiversity Offset Strategy Outline (BOSO). The Department of Primary Industries (DPI - NSW Fisheries) were consulted with regards to maintaining access to Thompsons Creek Reservoir for recreational fishing, with an Access License Deed signed in July 2013.

The BOMP was approved initially by DPE on 24 August 2015. The BOMP was revised and submitted to NSW EPA for comment on 9 April 2019. The NSW EPA had no specific comments, per their letter of 25 April 2019. The revised Lamberts North BOMP was submitted for approval to DPIE on 2 May 2019. Feedback was received from DPIE on 26 June 2019 and the Biodiversity and Conservation Division (BCD) of DPIE on 17 September 2019.

Stakeholder	Feedback / Approval	Dates
DPE (now DPIE)	Approval to conduct a staged BOMP approach for Lamberts North and Lamberts South. Request for Lamberts North BOMP to be submitted by 16 May 2013, and rejection of request for a 12 month extension Request for a BOSO for Lamberts South by 16 May 2013	11 January 2013
OEH (now DPIE)	Feedback on the Lamberts North BOMP and Lamberts South BOSO	14 May 2013
DPE (now DPIE)	Approval of Lamberts South BOSO Rejection of Lamberts North BOMP. Feedback and requirements for the BOMP	18 June 2013
DPI (NSW Fisheries)	Access License Deed between DPI and Delta Electricity for Thompsons Creek Reservoir.	19 July 2013
DPE (now DPIE)	Response to letter from EA dated 12 September 2013. Request for BOMP to be resubmitted and include details for offset.	11 November 2013
DPE (now DPIE)	Noted that it is considered highly unlikely to obtain access to the Lamberts South Site. Requested to be advised of any further updates and decision	17 February 2014

DPE (now DPIE)	Approval of revised BOMP dated July 2015	24 August 2015
NSW EPA	Feedback on BOMP	29 April 2019
DPIE	Feedback and comments on revised BOMP	26 June 2019
BCD (formerly OEH) of DPIE	Feedback on revised BOMP	17 September 2019

1.6.2 Community Consultation

The Acclimitisation Society of NSW was consulted regarding the formation of the Thompsons Creek Reservoir BOA in which they requested a 30 m foreshore buffer to allow continued access for recreational fishing. Updates to this BOMP are discussed as part of ongoing consultation with the Mt Piper Community Consultative Committee.

2 BIODIVERSITY OFFSET AREA

2.1 Description

Thompsons Creek Reservoir was identified as a suitable BOA for Lamberts North following the results of a decision-making review process of EnergyAustraliaNSW owned land in the vicinity of Lamberts North. Through this process, various government and community organisations were consulted (see Section 1.6) and the BOA was selected to build upon existing revegetation programs undertaken at Thompsons Creek Reservoir, with the aim of improving native vegetation connectivity in the region.

The BOA is a 6.8 ha land parcel comprised of two lots:

- Lot 243 of DP 801915 east site estimated 4.7 ha with approximately 605 m of foreshore
- Lot 432 of DP 803501 south side estimated 2.1 ha with 200 m of foreshore.

The BOA is located on the eastern foreshore of Thompsons Creek Reservoir that is owned and operated by EnergyAustraliaNSW for water storage purposes. The BOA is bounded by EnergyAustraliaNSW landholdings except for private landholdings along the southern boundary (refer to Figure 3).

Access is via Willow Park Road car park through land owned by EnergyAustraliaNSW. An access agreement allows passage for anglers to fish on the reservoir and ensures there is no public vehicular access with foot access only permissible for non-authorised vehicles. A locked access gate is located on the eastern side of the BOA (see Figure 3) and there are no vehicle access tracks located beyond this gate within the BOA itself.

2.2 Offset suitability

The Thompsons Creek Reservoir BOA is deemed a suitable site to offset 5 ha of rehabilitated vegetation to be removed from Lamberts North given:

- The 6.8 ha BOA exceeds the 1:1 offset ratio deemed suitable for the 5 ha section of rehabilitated vegetation to be removed (see Appendix A; DPI, 2013)
- The BOA is suitably located in the vicinity of Lamberts North, approximately 9 km south-west, with both sites occurring within the Capertee Uplands IBRA sub-region
- The BOA secures an area of grassland and naturally regenerating open woodland of greater conservation value than that being impacted at Lamberts North (SKM, 2010; ELA, 2016; ELA, 2018)
- The BOA has a high capacity to be revegetated (revegetation works have already commenced at the site – see section 3.5) to a native woodland consistent with the surrounding area and existing revegetation programs at Thompsons Creek Reservoir.

It should be noted that the Environmental Assessment (SKM, 2010) indicated that the modified lands of Lamberts North have no conservation value and as such, there were no direct or indirect impacts to biodiversity resulting from the ash placement works associated with Lamberts North. Therefore, Condition B6 (e) is not applicable to this BOMP.

2.3 Offset Security

EnergyAustraliaNSW are committed to securing the Thompsons Creek Reservoir BOA in perpetuity by the 30 June 2021. Guidance will be sought from DPIE (North West) and the BCT for the suitability of managing the BOA under a formal conservation mechanism. The intention of this is to secure the BOA and provide the financial and management resources required to enhance its biodiversity values. Upon execution of the formal conservation mechanism, EnergyAustraliaNSW will have a legal obligation to implement the required management strategies contained within this BOMP.

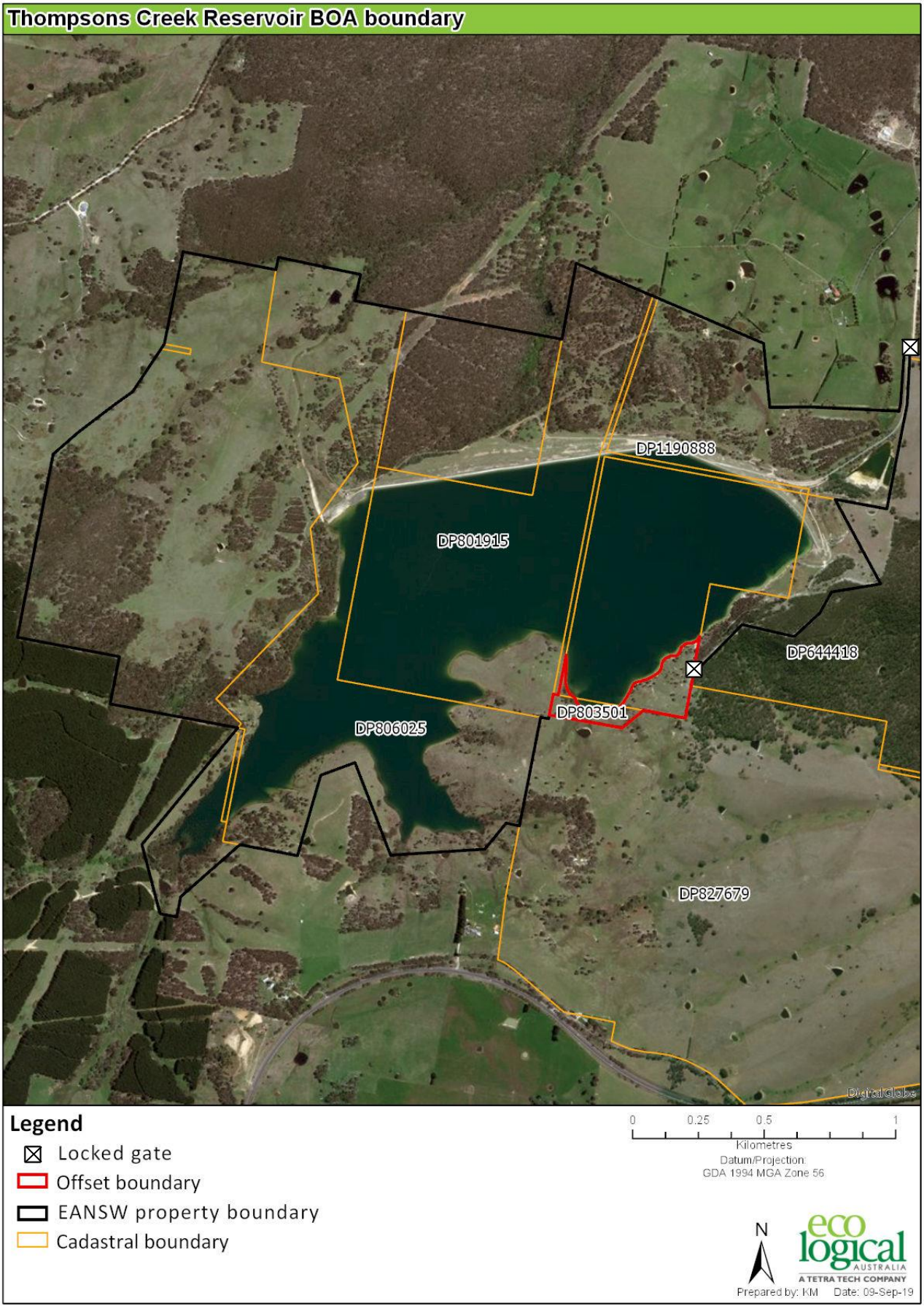

Figure 3: Thompsons Creek Reservoir Biodiversity Offset Area

2.4 Baseline Environment

2.4.1 Climate

The average rainfall and temperature data has been sourced from Weather Zone for Lithgow (Birdwood Street) and is considered to be indicative of climatic conditions typical of the BOA (Figure 4; Weather Zone, 2019).

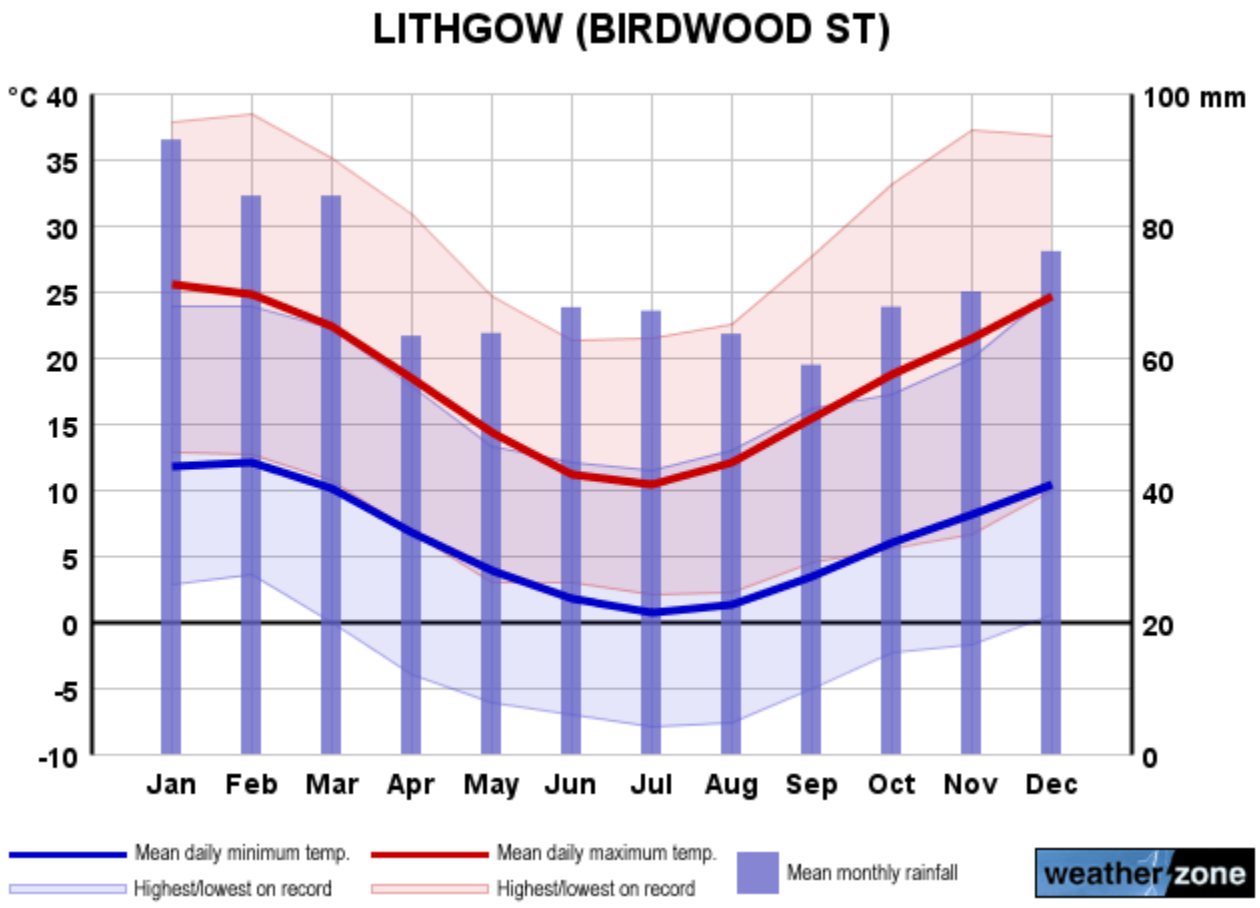

Figure 4: Lithgow weather station records

2.4.2 Geology and Soils

The BOA is situated at the western limit of the Sydney Basin. Three major geological types are present including Triassic sediments of the Narrabeen Group, Permian sediments of the Illawarra Coal Measures and Devonian sediments of the Shoalhaven Group. The BOA is dominated by Permian sediments which are located in the north east of the BOA, along with Devonian sediments located in the south west. The BOA is located within the Cullen Bullen soil landscape formation. The Cullen Bullen formation is characterised by low rolling hills, low topsoil fertility, moderate to low pH buffering capacity and low available water holding capacity.

2.4.3 Aboriginal Cultural Heritage Values

The BOA is situated on previously disturbed, former agricultural land and it is considered unlikely that any items of Aboriginal cultural heritage occur within the BOA. A search of the Aboriginal Heritage Information Management System (AHIMS) database was conducted on 3 June 2013. No Indigenous heritage items have been recorded within the BOA site. There are no native title claims, Indigenous land use agreements or joint management arrangements over this land.

2.4.4 Non-Aboriginal Heritage

The BOA is situated on previously disturbed, former agricultural land and it is considered unlikely that any items of cultural heritage occur within the BOA. A search of the National Heritage List, State Heritage Register and Lithgow City Local Environment Plan heritage schedule was conducted on 3 June 2013. No items of historic, cultural or natural heritage values are listed on or in the vicinity of the BOA site.

2.4.5 Biodiversity

2.4.5.1 Vegetation communities

The vegetation within the BOA reflects its agricultural history, with the dominant vegetation community comprising a formerly cleared derived grassland. This grassland is dominated by native grasses, with a mix of both native and exotic herb species. Patches of partly-cleared and regenerating open forest are also scattered throughout the BOA, including Broad-leaved Peppermint grassy open forest and Ribbon Gum – Snow Gum grassy open forest. Remnant forms of these open forest communities occur directly adjacent to the BOA, providing a direct reference as to the former vegetation of the BOA, as well as providing a source of natural tree regeneration within the BOA (see section 3.4). An approximately 1 ha area of the BOA has been planted with a variety of native species characteristic of the surrounding remnant vegetation (see section 3.5).

2.4.5.2 Flora Surveys

Eco Logical Australia (ELA) was engaged by EnergyAustraliaNSW to undertake baseline flora monitoring within the BOA during summer 2016, along with follow up monitoring spring 2018.

A total of four floristic monitoring sites were established in 2016 as part of the monitoring program, which included three sites within the BOA and one analogue site located in remnant woodland directly adjacent to the BOA (Figure 5). Analogue site TD4 provides an effective reference for the remnant vegetation of the surrounding area and contains representative species present within the BOA (see Figure 6). The baseline monitoring confirmed natural native tree regeneration is occurring adjacent to areas of remnant vegetation.

A total of 54 species (34 native species and 20 exotic species) were recorded across all floristic monitoring sites during 2016 monitoring (ELA, 2016). All four sites had relatively similar total species numbers ranging from 19 to 25 species. A total of 37 flora species (31 native species and six exotic species) were recorded across all floristic monitoring sites during 2018 monitoring (ELA, 2018). All four sites had relatively similar total species numbers ranging from 13 to 20 species. The overall species richness for all sites was lower during 2018 monitoring, however this was expected given the drought conditions experienced across the region prior to the survey being undertaken. Higher native species richness was recorded at the Analogue site (TD4) during both monitoring periods

reflecting the remnant vegetation present at the site. The total number of exotic species reduced from 20 species in 2016 to six species recorded in 2018, with the prevalence of exotic species at sites TD1, TD2 and TD3 reflecting the nature of historical disturbances that have taken place across the BOA. A full list of all flora species recorded within the BOA is included in Table A- 1.

2.4.5.3 Fauna Surveys

ELA was engaged by EnergyAustraliaNSW to undertake baseline fauna monitoring within the Thompsons Creek Reservoir BOA during summer 2016, along with follow up monitoring spring 2018. The BOA is located directly adjacent to a large body of water in Thompsons Creek Reservoir and the remnant woodland of Falnash State Forest. The proximity of the BOA to both of these features provides added habitat value through landscape connectivity and the attraction and recruitment of individual and assemblages of species.

A list of all fauna species recorded during monitoring is included in Table A- 2. A total of 32 individual fauna species were recorded during 2016 monitoring, comprising 26 bird, one reptile and 14 mammal species (including nine microchiropteran bat species) (ELA, 2016). This includes fauna species opportunistically recorded throughout and immediately surrounding the BOA. Three feral pest species were recorded across the BOA, all of which were mammal species and are listed as priority pests under Section 5 of the Central Tablelands Regional Strategic Pest Management Plan 2018-2023 (Local Land Services 2018). Two threatened species listed under the BC Act were recorded during monitoring, of which one species is also listed under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Both threatened species were microchiropteran bats, namely *Chalinolobus dwyeri* (Large-eared Pied Bat) and *Miniopterus orianae oceanensis* (Eastern Bent-winged Bat) (see Figure 6).

A total of 26 individual fauna species were recorded during the 2018 monitoring, comprising 17 bird, seven mammal, one amphibian and one reptile species (ELA 2018). This includes fauna species opportunistically recorded throughout and immediately surrounding the BOA. Three feral pest species were recorded across the BOA, which included one bird species and two mammal species, all of which are listed as priority pests under Section 5 of the Central Tablelands Regional Strategic Pest Management Plan 2018-2023 (Central Tablelands Local Land Services 2018). Two threatened species listed under the BC Act were recorded during monitoring. Both threatened species were birds, namely *Petroica phoenicea* (Flame Robin) and *Daphoenositta chrysoptera* (Varied Sittella) (see Figure 6).

The widespread absence of canopy and midstorey vegetation across the BOA is a significant limitation for fauna habitat, in particular for bird species. The absence of this vegetation further limits habitat quality with no potential for secondary habitat to occur in the form of fallen logs, leaf litter and associated debris. Additionally, no rock outcrops or crevices were observed throughout the BOA. The effect of these habitat limitations can be seen in the minimal occurrence of reptiles and other ground fauna species.

Figure 5: Thompsons Creek Reservoir BOA Flora and Fauna Monitoring Sites

Figure 6: Thompsons Creek Reservoir BOA Vegetation Mapping and Threatened Species

3 MANAGEMENT STRATEGIES

This section details the management measures to protect and manage the native vegetation and habitat within the BOA.

3.1 Fencing

Fencing has been used to demarcate the boundaries of the BOA to exclude stock and to protect from unauthorised access and disturbance. All boundary fencing required at the BOA has been completed. It is not considered necessary at this point to erect internal fencing for any areas of specific ecological significance. Fencing will be continually inspected to ensure it remains adequate to secure the BOA and exclude feral pests.

All boundary gates will be secured with a lock to restrict unauthorised access. Any future fencing used within, or on the boundary of, the BOA will use as little barbed wire as possible, to minimise the potential impact on native fauna species. Barbed wire will only be used in situations where fences are designed for exclusion, such as to protect revegetation works.

3.2 Vertebrate Pest Management

Feral Goats (*Capra hircus)*, Red Fox (*Vulpes vulpes*) and European Rabbits (*Oryctolagus cuniculus*) have been identified in small numbers within the BOA. These species are all listed as priority pests under Section 5 of the Central Tablelands Regional Strategic Pest Management Plan 2018-2023 (Central Tablelands Local Land Services, 2018). These pest species may impact on native fauna through predation and competition for resources such as food, shelter, and breeding sites. Feral pests can also have a detrimental effect on regenerating areas, as well as soil stability. Where possible, EnergyAustraliaNSW will seek collaboration with neighbouring land-owners to develop a strategic approach to pest management.

A program of rabbit control was undertaken prior to revegetation works in 2016, including the destruction of warrens. 2018 monitoring recorded the continued presence of European Rabbits in the BOA however, so the need for continued management remains. Monitoring of pest animal populations and the effectiveness of the control program will be undertaken through the biannual inspections, along with biennial monitoring. Inspections will be undertaken by EnergyAustraliaNSW environmental officers and monitoring and pest animal control undertaken by suitably qualified, experienced and licensed contractors. This will allow the effectiveness of the pest management program to be determined and allow for updates to be made if required.

3.3 Weed Management

Serrated Tussock (*Nassella trichotoma*) and Blackberry (*Rubus fruticosus* sp. aggregate) were recorded in the BOA during 2016 baseline monitoring. These species are listed as State and Regional priority weeds under the Central Tablelands Regional Strategic Weed Management Plan 2017-2022 (Central Tablelands Local Land Services, 2017). Both species were successfully treated, with neither species recorded during 2018 monitoring.

Consistent with the objectives of the BOMP an effective weed control program will be continually implemented to limit the spread and colonisation of weeds within the BOA, including listed weed species (Central Tablelands Local Land Services, 2017).

The weed control program for the BOA will include biannual (twice yearly) inspections across the BOA to:

- identify the extent of any weed infestations
- assess the effectiveness of the weed control program and make any necessary modifications to the program.

Inspections will be undertaken by EnergyAustraliaNSW environmental officers and monitoring and weed control undertaken by suitably qualified, experienced and licensed contractors (e.g. Certificate IV Land Management and/or ChemCert accredited).

3.4 Assisted Natural Regeneration

Natural regeneration is occurring adjacent to areas of remnant vegetation featuring native canopy species such as *Eucalyptus viminalis* (Ribbon Gum) and *Eucalyptus pauciflora* (Snow Gum). Continued natural regeneration will be promoted with no plantings to be undertaken within a 10 m buffer zone from areas of active regeneration. This will allow natural regeneration to continue to occur unabated by revegetation works. Natural regeneration will also be assisted through the following management strategies:

- weed and pest animal inspections and monitoring
- weed and pest animal control to reduce competition and restrict grazing pressure.

3.5 Active Revegetation

Planting of native canopy species is an essential component to the regeneration of the BOA as it will add vegetation structure, missing since the site was partially cleared for agricultural activities. Targeted weed control is required at planting sites prior to planting, in order to build up soil moisture and provide an area free from competition by exotic species. A committed post-planting weed management program will also be required to provide juvenile trees with an opportunity to grow free from competition by exotic species.

Tube-stock planting has already been undertaken within the BOA (section 3.5.1), with further revegetation works also planned for the BOA (see section 3.5.2).

3.5.1 Revegetation works to date

Revegetating works were undertaken across the BOA in 2017, with approximately 2,000 seedlings planted across a 1 ha (approximate) section of the BOA. The species planted are outlined below in Table 2. A total of 547 successfully established seedlings were recorded during the 2018 monitoring, with the highest abundance occurring in the south-west corner. Eucalypt species were the most successful establishers, which included key canopy species characteristic of the surrounding

vegetation communities. During 2018 monitoring, both native and feral herbivore scats were abundant throughout the planting area, as well as chewing marks on some seedlings, highlighting the active grazing pressure placed on the plantings by these species. Planting success rates were also likely limited by prolonged drought conditions experienced across the region. Despite this, the rate of successfully established plantings is still well in excess of the target density of 160 stems/ha.

Table 2: Indicative Revegetation species list

Scientific Name	Common Name
Eucalyptus dives	Broad-leaved Peppermint
Eucalyptus mannifera	Brittle Gum
Eucalyptus viminalis	Ribbon Gum
Eucalyptus pauciflora	Snow Gum
Eucalyptus dalrympleana	White Gum
Eucalyptus goniocalyx	Long-leaved Box
Acacia falciformis	Mountain Hickory
Exocarpos strictus	Dwarf Cherry
Pultenaea microphylla	-
Dillwynia phylicoides	-
Pteridium esculentum	Bracken Fern
Acacia irrorata subsp. *irrorata*	Green Wattle
Acacia dealbata	Silver Wattle
Lissanthe strigosa	Peach Heath
Leucopogon pilifer	Thready Beard-heath
Indigofera australis	Australian Indigo

3.5.2 Future revegetation works

Future revegetation works are likely to involve the implementation of direct seeding. Direct seeding is a revegetation method of spreading seed across a desired area, rather than individually planting seedlings/tube stock. Direct seeding can provide advantages compared to tubestock planting as it generally requires a lower initial cost, is less labour intensive and results in a more natural appearing final landscape.

A key element of direct seeding is the conservation of moisture in the ground for several months before seeding. This is achieved by eliminating weed vegetation one metre either side of the seeding line. This weed management process should start at a minimum, in the autumn prior to sowing in the spring, or in spring through to summer if sowing in the autumn.

The ideal sowing period in the Lithgow area is subject to conjecture, however, local rainfall records indicate that both autumn and spring are most suitable. The softer environment of Thompson's Creek Reservoir allows a reasonable window of opportunity with regard to the timing of direct seeding. In previous cases in the Lithgow area, the spring months have been favoured, particularly during late September through to October.

The suggested timetable to undertake direct seeding is:

- Autumn – seed collection, particularly of Snow Gum to allow time for stratification
- Autumn – commence weed control to start storing moisture in the soil – non-residual herbicide application (glyphosate) in a strip of 1 m width on the contour. Spraying/seeding lines should be 5-7 m apart, meaning 1.5-2 km of line per ha.
- Spring – direct seeding lines sprayed out with the herbicide again.
- Spring – direct seeding conducted, 20-30 cm wide scalping of ground and seed applied
- Summer - follow-up hand weeding of seeding lines to reduce competition
- If this program is not possible to start in autumn, the program can be run from spring to autumn, although spring sowing is preferential.
- Suggested species to use in direct seeding works are outlined below in Table 3.

Table 3: Indicative direct seeding revegetation species

Scientific Name	Species
Acacia dealbata	Silver Wattle
Eucalyptus bridgesiana	Apple Box
Eucalyptus dives	Broad-leaved Peppermint
Eucalyptus macrorhyncha	Red Stringybark
Eucalyptus mannifera	Brittle Gum
Eucalyptus melliodora	Yellow Box
Eucalyptus pauciflora	Snow Gum
Eucalyptus rubida	Candlebark Gum
Eucalyptus viminalis	Ribbon Gum
Allocasuarina littoralis	Black She-oak
Lissanthe strigosa	Peach Heath
Brachyloma daphnoides	Daphne Heath

3.6 Re-establishment of fauna habitat

Fauna habitat will be re-established and enhanced through revegetation works. Active revegetation and assisted natural regeneration will provide habitat for a range of fauna species, including various threatened woodland fauna recorded in the surrounding area. Revegetation will also enhance habitat connectivity in the local area, providing further benefits to native fauna species. Any additional fauna habitat works will be advised as part of the biennial biodiversity monitoring assessment.

3.7 Erosion and Sedimentation

Biodiversity monitoring undertaken in spring 2018 directly assessed surface and erosion issues and found no significant occurrences of erosion within the BOA. Erosion conditions will continue to be inspected biannually by EnergyAustraliaNSW, as well as through biennial biodiversity monitoring. Erosion and sedimentation issues identified through this monitoring will be managed following the requirements detailed within *Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom, 2004) and *Volumes 2A, 2C, 2D and 2E* (the Blue Book) (DECC, 2008). If any new areas of significant erosion concern are identified during inspections, appropriate short-term erosion and sediment controls will be implemented and longer-term stabilisation actions, such as vegetation establishment, will be investigated.

Table 4 below outlines the actions to be implemented to control and manage erosion.

Table 4: Erosion Control Plan

Management Action	Implementation Timeframe	Performance Targets
Inspect and map significant (or potentially significant) erosion areas/occurrences	Ongoing monitoring for significant erosion outbreaks	Remediation of erosion areas and ongoing controls implemented
Develop and implement erosion control and remediation protocols	Remediation of erosion areas as required Inspection of remediated areas and ongoing monitoring	

3.8 Bushfire Management

Bushfire management will facilitate the exclusion (where possible) of fire from regeneration and revegetation areas to allow the young plants to mature to a stage where they are able to withstand bushfire and regenerate (re-sprout or seed) naturally following such an event (nominally at least 8 years but dependent on the success of plant establishment; NSW RFS, 2006).

To ensure the appropriate protection of life and property, the entrance track and gate (see Figure 3) to the BOA will be maintained to enable access for emergency fire-fighting purposes.

3.9 Offset Monitoring

The BOA will be subject to an ongoing monitoring program to measure the success of management and regeneration strategies in meeting the performance indicators as set out in Section 4. The monitoring program will incorporate systematic ecological monitoring as well as biannual (twice yearly) inspections for weeds and feral animals conducted by EnergyAustraliaNSW environmental officers. Flora and fauna monitoring conducted by suitably qualified and experienced ecologists who hold the necessary permits and licenses to undertake monitoring (e.g. *National Parks and Wildlife Act 1974* NSW Scientific License). Monitoring will be undertaken biennially (every second year) for the first 10 years then reviewed after this period (2016-2026).

3.9.1 Flora Monitoring

Floristic monitoring will be undertaken in permanent plots. Four floristic plots were established and surveyed (three sites within the BOA and one analogue site immediately adjacent to the BOA; Figure 5) during summer 2016. Biennial floristic surveys will include the following methodology:

- Full floristic surveys of a 20 m x 20 m nested plot recording cover abundance scores for each species
- Native tree cover and native mid-storey cover – at regular 5 m intervals along 50 m transect
- Native ground (grass, shrub, other) and exotic cover – at regular 1 m intervals along 50 m transect; and
- Habitat features (number of trees within hollows, length of fallen logs) and proportion of over-storey species regeneration – within 20 m x 50 m plot.

Each transect and quadrat was established using the following technique:

- Each site was randomly selected within the desired stratification unit;
- A 50 m transect was laid out across the slop, and did not cross transitional boundaries;
- A 20 m x 20 m quadrat was established at the start of the 50 m transect;
- A metal star picket was installed at the start and end point of each transect as well as each corner of the quadrat;
- Each start and finish point was recorded using GPS. A GPS point was also recorded at the north-western corner of the quadrat. In addition to this, photographs were taken at each of these points.

The location of flora plots is displayed in Figure 5.

3.9.2 Fauna Monitoring

The fauna monitoring program will focus on species which are good indicators of improvements in habitat structure, with birds being the primary focus. Other fauna assemblages are also to be recorded opportunistically to inform general site diversity.

Two fauna monitoring sites were established in 2016 (Figure 5). Table 5 below provides the survey methods to be applied to the fauna monitoring sites.

Table 5: Fauna monitoring methodology

Method	Detail	Requirement
Bird survey	Timed, fixed area surveys for diurnal birds, observing and listening.	20 minutes count morning and afternoon over 2 days
Opportunistic Observations	Opportunistic observations will be recorded for all birds, mammals, reptiles and amphibian's species observed onsite. Evidence of scats, scratching's, and diggings will also be recorded with all evidence of feral animal activity noted and recorded with a GPS.	Opportunistic

3.9.3 Revegetation assessment

Field survey of revegetated areas within the BOA will be undertaken to assess the success or failure of the revegetation program undertaken to date. The revegetation program survey will be undertaken via traversing the area and recording the following:

- Plant species that have established
- Presence of exotic weed infestations
- Evidence of pest animals (scats, prints, burrows/warrens)
- Surface stability and erosion issues
- Recommendations for future revegetation works (if required).

3.9.4 Natural Regeneration assessment

Field survey of areas of natural regeneration will be undertaken to assess and map the continued development of natural regeneration within the BOA. The following information will be recorded:

- All occurrences of native canopy species regeneration will be identified to species level in two stem size classes (<5 cm; 5-15 cm – diameter at breast height) and mapped using a handheld GPS
- Any evidence of weed or pest animal interreference with natural regeneration.

4 PERFORMANCE CRITERIA

Table 6 provides the performance and completion criteria for key management actions described in the management strategies section. Where performance criteria are not achieved, potential causes will be investigated; corrective actions required to achieve the criteria and/or justification why criteria have not been achieved, will be provided as part of annual reporting.

Table 6: Performance and completion criteria

Action	Management Action	Performance criteria	Completion criteria	Timeframes	Responsibilities
Fencing installation	Boundary of BOA fenced	Fencing installed prior to commencement of revegetation work.	Boundary fence installed around BOA	Completed	EnergyAustraliaNSW Environmental Team
	Gates secured with lock to prevent unauthorised access	All access points to BOA made secure	Access to BOA restricted to authorised personnel	Completed	EnergyAustraliaNSW Environmental Team
	Ongoing maintenance and monitoring of fencing Minimise use of barbed wire for future fencing works	Fences are maintained and monitored Barbed wire only to be used for exclusion zones such as revegetation areas.	All fences remain fit for purpose Use of barbed wire limited to areas for exclusion	Ongoing. Fences inspected during biannual inspections, and maintained as needed	EnergyAustraliaNSW Environmental Team
Vertebrate pest control	Baseline survey of vertebrate pests across BOA	Undertake baseline monitoring prior to revegetation works	Baseline level of vertebrate pests recorded	Completed	Qualified ecologists
	Implement a vertebrate pest management program	Consultation with surrounding land-owners to develop strategic program Adapt program based on baseline and biennial monitoring results	Adaptive vertebrate pest management program developed	Completed Continue to update based off monitoring results	EnergyAustraliaNSW Environmental team through consultation with surrounding land-owners

Action	Management Action	Performance criteria	Completion criteria	Timeframes	Responsibilities
	Undertake vertebrate pest control program	Vertebrate pests eradicated and no non-target species affected	Levels of vertebrate pests is do not pose a risk to revegetation works	Vertebrate pest control program undertaken prior to revegetation works Continue control program as needed based off biannual inspections and biennial monitoring results	Licenced and experienced pest management contractors
	Monitor pest animal populations	Undertake biannual inspections Complete biennial monitoring	Monitoring is ongoing, to determine continuing effectiveness of control program	Biannual inspections and biennial monitoring (2016-2026)	Inspections undertaken by EnergyAustraliaNSW Environmental Team Monitoring undertaken by qualified ecologists
Weed control	Baseline survey of weed presence	Undertake baseline survey of weed presence prior to revegetation works	Baseline weed presence recorded	Completed	Qualified ecologists
	Implement weed control program	Weed infestations identified Develop strategic program Adapt program based on biannual inspections	Adaptive weed treatment program developed	Completed Continue to update based off inspection and monitoring results	EnergyAustraliaNSW Environmental Team
	Ongoing inspections and monitoring of BOA for weed presence	Undertake biannual inspections and biennial monitoring	Ongoing inspections and monitoring to determine	Biannual inspections and biennial	EnergyAustraliaNSW Environmental Team

Action	Management Action	Performance criteria	Completion criteria	Timeframes	Responsibilities
			continuing effectiveness of treatment	monitoring (2016-2026)	and qualified ecologists
	Treat any state or regional priority weeds observed	Control of serrated tussock and blackberry in BOA Records of treatment retained	No listed weeds present within BOA No areas of high density weed infestations present which limit regeneration / revegetation of the BOA	Completed - *Nassella trichotoma* and *Rubus fruticosus* agg. were successfully treated following the baseline survey in 2016	Works to be undertaken by qualified and experienced weed management contractors
Assisted Natural Regeneration	Create a buffer zone from areas of revegetation	No plantings to be undertaken within a 10 m buffer zone from areas of active regeneration	Natural regeneration continues unabated by revegetation works	Stage 1 planting completed in 2017 and Stage 2 direct seeding planned for 2019-2020	Qualified and experienced revegetation contractors
	Assist natural regeneration through weed and pest animal management strategies	Undertake weed and pest animal inspections and monitoring Control weed and pest animal levels to reduce competition and grazing pressure	Weed and pest animals controlled to a level that does not impact on natural regeneration	Ongoing weed and vertebrate pest management based off inspection and monitoring results	Pest control undertaken by licenced and experienced pest management contractors Weed control undertaken by qualified and experience weed management contractors
	Monitor natural regeneration	Natural regeneration levels recorded during biennial monitoring	Monitoring records continued development of natural regeneration and identifies	Ongoing biennial monitoring (2016-2026)	Qualified ecologist

Action	Management Action	Performance criteria	Completion criteria	Timeframes	Responsibilities
			any requirement for management intervention		
Active revegetation	Include a species list and planting density consistent with surrounding vegetation communities in the BOMP	Gather data on dominant species within surrounding vegetation community	Species list and planting density consistent with surrounding vegetation community	Completed	Qualified ecologist and experienced revegetation contractors
	Include a Revegetation Schedule for areas where revegetation activities are required in the BOMP	Determine ideal sowing period for region Develop schedule based off local conditions	Revegetation schedule developed	Completed	Qualified ecologist EnergyAustraliaNSW Environmental Team
	Undertake tube stock planting	No plantings in the 30 m buffer zone commencing at the edge of the high-water mark or 10 m buffer zone from natural regeneration areas	Establishment of locally native species at a density greater than 160 stems/ha	Stage 1 planting completed in 2017	Qualified and experienced revegetation contractors
	Undertake direct seeding	No plantings in the 30 m buffer zone commencing at the edge of the high-water mark or 10 m buffer zone from natural regeneration areas	Establishment of locally native species at a density greater than 160 stems/ha	Stage 2 direct seeding planned for 2019-2020	Qualified and experienced revegetation contractors
	Inspection of revegetation works	Undertake biannual inspections	Inspections identify any requirement for adaptive management of Revegetation Schedule	Inspections undertaken biannually	EnergyAustraliaNSW Environmental Team
	Monitoring of revegetated works	Undertake biennial monitoring	Monitoring confirms establishment of native species at a density greater than 160 stems/ha	Monitoring undertaken biennially (2016-2026)	Qualified ecologist

Action	Management Action	Performance criteria	Completion criteria	Timeframes	Responsibilities
Re-establishment of fauna habitat	Re-establish fauna habitat through assisted natural regeneration and active revegetation of the BOA	Re-establishment of native woodland consistent with surrounding vegetation communities	Establishment of locally native species at a density greater than 160 stems/ha	Stage 1 planting completed in 2017 and Stage 2 direct seeding planned for 2019-2020	EnergyAustraliaNSW Environmental Team Qualified and experienced revegetation contractors
Erosion and Sedimentation	Complete baseline erosion inspection within BOA	Undertake baseline inspection of erosion within BOA prior to revegetation works	Any instances of active erosion present within the BOA recorded	Completed	Qualified ecologist
	Implement Erosion and Sediment Control measures for areas identified with erosion and sediment management issues	Implement measures, generally following guidelines in *Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom 2004) and the Blue Book (DECC 2008)	No active erosion within BOA	Ongoing, based off results from biannual inspections	EnergyAustraliaNSW Environmental Team
	Monitor erosion conditions within the BOA	Undertake biannual inspections of BOA to identify active erosion	Outbreaks of active erosion within BOA recorded	Biannual inspections	EnergyAustraliaNSW Environmental Team
Bushfire Management	Manage bushfires for exclusion from regenerating/revegetating areas	Bushfire events excluded from regenerating / revegetating areas where possible	Vegetation matures to a stage where it can withstand bushfire and regenerate naturally following fire events	Up to 8 years following completion of revegetation works (dependent upon revegetation success)	EnergyAustraliaNSW Environmental Team
	Maintain entrance track to BOA and gate to enable access for fire-fighting	Undertake biannual inspections of BOA entrance track and gates Maintain and update track and gate as needed	Entrance track and gate maintained to a safe, accessible condition	Ongoing. Biannual inspections undertaken to assess track and gate conditions	EnergyAustraliaNSW Environmental Team

Action	Management Action	Performance criteria	Completion criteria	Timeframes	Responsibilities
Offset Monitoring	Undertake flora monitoring	Establish permanent monitoring plots and undertake baseline monitoring Biennial floristic monitoring undertaken	Ongoing flora monitoring completed and results reported and implemented for adaptive management of the BOA	Baseline monitoring completed Biennial floristic surveys for 10 years (2016-2026)	Qualified ecologist
	Undertake fauna monitoring	Undertake baseline monitoring Develop a list of key indicator bird species representative of improvements in habitat structure Undertake biennial systematic fauna monitoring, focusing on bird surveys, as well as opportunistic observations	Ongoing fauna monitoring completed and results reported and implemented for adaptive management of the BOA	Baseline monitoring completed Biennial fauna surveys for 10 years (2016-2026)	Qualified ecologist
Secure BOA in perpetuity	EnergyAustraliaNSW to liaise with DPIE / BCT to secure offset in perpetuity	Engagement with DPIE / BCT to secure offset in perpetuity	BOA secured in perpetuity under a formal agreement	Engage with DPIE / BCT (2019) Secure BOA (2020-2021)	EnergyAustraliaNSW Environmental Team

5 CONTINGENCY PLAN

A risk assessment specific to the BOMP was conducted applying the consequence and probability risk matrix to identified aspects (EnergyAustraliaNSW, 2017). Ratings are determined inclusive of existing controls. No high risks were identified. **Table 7** provides a summary of the key low and moderate risks and associated contingency measures for implementation, if triggers are identified.

Table 7: Summary of Risks, Controls, Triggers and Contingency Measures

Risk Description	Existing Control Description	Initial Risk	Trigger	Contingency Measures	Residual Risk
Unauthorised access or disturbance impacting on ecological values of the BOA	Boundary fence installed around BOA Gates secured with locks Access is via EnergyAustraliaNSW owned land with no internal roads within BOA Signage prohibiting unauthorised access	Medium	Damage leads to widespread reduction in landscape / vegetation quality and condition, as identified during biannual inspections and/or biennial monitoring	Investigate and determine unauthorised access Implement additional security measures as required	Low
Non-target fauna species affected by vertebrate pest control program	Control program to be implemented by experienced and licensed contractors to minimise the possibility of affecting non-target fauna species	Medium	Site inspections and monitoring identifies non-target fauna species affected by control program	Control program will include methods to minimise the possibility affecting non-target fauna species and adhere to the most current and best practice guidelines	Low
Vegetation condition impacted during weed control activities in the BOA	Use targeted weed application methods	Medium	Biannual inspection identifies vegetation condition has decreased following weed control actions	Inspection will determine the level or impact and will detail actions to rectify Corrective actions may include revision of weed	Low

Risk Description	Existing Control Description	Initial Risk	Trigger	Contingency Measures	Residual Risk
				control procedures, or additional revegetation works	
Presence of listed priority weed species	Biannual inspections and biennial monitoring Implementation of weed control program	Medium	Inspections and/or monitoring record presence of listed priority weed species	Undertake weed control works Ongoing inspection and monitoring to determine success of weed control	Low
Failure of revegetation works	Biannual inspections and biennial revegetation monitoring Use of multiple complimentary revegetation methods (tube-stock planting and direct seeding)	Medium	Inspections and/or monitoring identifies failed revegetation	Investigate potential causes, and provide detailed actions to rectify, including re-planting / re-seeding.	Low
Outbreak of active erosion	Development of erosion control plan Biannual inspections and biennial monitoring	Medium	Active erosion identified during inspection of BOA	Assess erosion site for risk severity and repair erosion site as necessary	Low
Bushfire impacting on early stages of revegetation or high frequency fire impacting ecological values in the BOA	Maintain access track and gate Biannual inspections and biennial monitoring	Low	Monitoring of burnt areas in BOA indicates natural regeneration is not occuring	Determine the level of bushfire impacts and recommend specific actions to rectify the loss and further mitigate bushfire risks	Low

Risk Description	Existing Control Description	Initial Risk	Trigger	Contingency Measures	Residual Risk
Scarcity of fauna habitat	Re-establishment of native woodland	Low	Re-establishment works not undertaken within specified timeframe (2020-2021)	Internal and external review of BOMP to ensure compliance with management strategies	Low

6 REPORTING

The key objective of this management plan is to improve the biodiversity values of the BOA. As such, there is a need to undertake flora and fauna monitoring on a biennial basis to determine the effectiveness of the plan. A detailed Ecological Monitoring Report will be prepared to collate and analyse data collected through ecological monitoring conducted during the biennial monitoring. Data is compared with results of previous years' monitoring and recommendations for ameliorative methods, management and the ongoing biodiversity monitoring program are provided by qualified ecologists. The Ecological Monitoring Report will report on the performance of the BOA, including the effectiveness of management activities. The Ecological Monitoring Report will be prepared by a qualified ecologist. A summary of the report findings will be included in the Lamberts North Annual Environmental Management Report (AEMR) submitted to DPIE.

Inspections on the effectiveness of weed and vertebrate control programs will be undertaken biannually. Reporting and updating of these programs will be completed on an annual basis and will be included in AEMR submitted to DPIE.

Incident reporting, in cases of material harm or un-approved impact to land, biodiversity or ecological communities, will be completed on a case by case basis. All environmental incidents are to be reported to management and documented in Energy Australia's incident management system for further investigation.

7 REVIEW

This BOMP shall be reviewed every three years and incorporate results of inspection and monitoring reports to identify trends and opportunities for improvement to ensure adaptive and best practice management can be undertaken.

This BOMP will be reviewed and, where necessary, updated following:

- An independent environmental audit which recommends changes to the BOMP
- A request from the Minister of the Environment to update the BOMP.

The EnergyAustraliaNSW Environmental Team Leader (or delegate) will be responsible for the implementation of the BOMP, as well as the implementation of any revisions of the BOMP resulting from consultation.

8 SUMMARY OF MANAGEMENT COMMITMENTS

The following is a summary of the management commitments relating to the BOA and detailed further above in Table 6.

- Maintain BOA access and fencing
- Control vertebrate pests and weeds
- Facilitate continued assisted natural regeneration
- Undertake active revegetation works

- Re-establish fauna habitat
- Manage erosion and sedimentation
- Manage bushfire risk of the BOA
- Undertake biannual inspections and biennial monitoring of the BOA
- Secure the BOA in perpetuity.

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APPENDIX A

Regulator Correspondence

Delta electricity

7 December 2012

Att: Kate Masters
Department of Planning and Infrastructure
22-33 Bridge Street
(GPO Box 39)
SYDNEY NSW 2000

Dear Ms Masters,

RE: LAMBERTS NORTH ASH REPOSTIORY PROJECT #09_0186 FOR MT PIPER POWERSTATION - BIODIVERSITY OFFSETS

In the early review of the Mt Piper Ash Placement Options, Delta Electricity identified the Lambert's North and South locations, being close to the station, and worked out open cut coal mines were the most logical locations for the repositories. The Environmental Assessment reflected that the two parts of the ash placement project were separated in time, and were subject to procurement of the lands from Centennial Coal.

The Environmental Assessment for the overall project identified a threatened community of Capertee Stringybark *(E.cannonii)* on a nine hectare area of remnant vegetation on the southern part of Lamberts South. Conditions of Approval for the Ash Placement project required that Delta develop a Biodiversity Offset Management Plan within 12 months of the project approval unless otherwise agreed by the Director-General.

Given that the original project was essentially two separate parts, Lamberts North and Lamberts South, Delta seeks approval to deliver two separate Biodiversity offset plans, one for each individual project site, in a timeframe that is consistent with the development of these parts.

In connection with the above, Delta seeks your approval to extend the Lamberts North Biodiversity Plan for an additional 12 months, allowing Delta to plan to offset 5 ha of re-vegetation equal or of better value to the proposed cleared areas on Lamberts North.

Subsequent to the approval of the Ash Placement Project, Centennial have indicated that they are planning a different future for the Lambert's South area, and that this will be incompatible with the planned ash placement on that site. Delta also seek your approval to submit the Lamberts South Biodiversity Plan one month prior to the construction of Lamberts South, should Centennial's plans not proceed, and Delta gain access to this site.

If you have any queries or comments regarding this letter please do not hesitate to contact me.

Yours faithfully

Warwick Robinson

Warwick Robinson
Asset Manager Western

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NSW GOVERNMENT | Planning & Infrastructure

Contact: Kate Masters
Phone: (02) 9228 6378
Fax: (02) 9228 6455
Email: kate.masters@planning.nsw.gov.au

Mr Luke Welfare
General Manager – Western
Private Mail Bag 1
PORTLAND NSW 2847

Dear Mr Welfare

Subject: Mt Piper Ash Placement project (MP09_0186) Biodiversity Offset Management Plan (BOMP) – Condition B6

I refer to Delta's correspondence dated 7 December 2012 seeking approval to:

- deliver two separate BOMPs (Lamberts North and Lamberts South);
- extend the timeframe for submitting the BOMP for Lamberts North by 12 months; and
- submit the BOMP for Lamberts South one month prior to construction of Lamberts South should Centennial's plans not proceed, and Delta gains access to the site.

The Department notes that project approval was granted on 16 February 2012 and that Condition B6 states that "*The BOMP is to be submitted within 12 months of the project approval, unless otherwise agreed to by the Director- General*".

The Department has considered the above request and Director-General's approval is granted pursuant to condition B6 to conduct a staged BOMP approach for Lamberts North and Lamberts South.

However, the Department does not believe that an appropriate justification has been given to warrant a 12 month extension to the timeframe for submitting the BOMP for Lamberts North. Consequently, the Director-General, pursuant to condition B6 requests that the BOMP for Lamberts North be submitted by the 16 May 2013.

Furthermore, the Department does not believe that submitting the BOMP one month prior to construction of Lamberts South is an acceptable approach. The Department recommended in its assessment that the BOMP be finalised within 12 months of the date of approval. Additionally, this was a recommendation made by the Office of Environment and Heritage to ensure that the offset was not 'lost', as the timeframe for construction of Lamberts South could be as late as 2020.

To ensure that this goal can be achieved, while recognising Delta's constraints, the Director-General requires:

- an outline of the offset strategy to be provided by the 16 May 2013, including a commitment that the BOMP will be submitted within 6 months of an access agreement being obtained; and
- Delta provide the Department with a status update on progress with gaining access to the Lamberts South site by February 2014.

Your contact officer for this proposal, Kate Masters, can be contacted on 9228 6378 or via email at kate.masters@planning.nsw.gov.au. Please mark all correspondence regarding the proposal to the attention of the contact officer.

Yours sincerely,

Felicity Greenway 11/1/13

Felicity Greenway
A/Director
Infrastructure Projects
As nominee for the Director-General

NSW GOVERNMENT | Office of Environment & Heritage

Your reference: B970851 & B990507
Our reference: DOC13/21372
Contact: Liz Mazzer 02 6883 5325

Nino Di Falco
Delta Electricity
Locked Bag 1
Portland NSW 2847

14 May 2013

Dear Mr Di Falco

RE Mt Piper Ash Repository Project 09_186 Lamberts North Biodiversity Offset Management Plan and Lamberts South Offset Strategy Outline

I refer to your email dated 9th May 2013 requesting comments on the Lamberts North Biodiversity Offset Management Plan (BOMP) and Lamberts South Biodiversity Offset Strategy Outline (BOSO) from the Office of Environment and Heritage (OEH).

It is understood that these offset strategy documents are intended to meet the requirements of Condition of Approval B6 for the Mt Piper Ash Repository Project. In our submission of 15th October 2010 (as part of the Department of Environment, Climate Change and Water [DECCW]), we recommended a condition of Project Approval,

The proponent must develop and implement a biodiversity offset in consultation with, and to the approval of, DECCW within 6 months of the date of Project Approval to compensate for the loss of:

- *Approximately 7.5 ha of native vegetation (Brittle Gum – Red Stringybark Woodland) including the loss of at least three individuals of the threatened Capertee Stringybark;*
- *Approximately 1.1 ha of native vegetation (Scribbly Gum Woodland); and*
- *Approximately 0.3 ha of native vegetation (Ribbon Gum Woodland).*

The native vegetation listed above is located on Lamberts South.

The final Conditions of Approval, specifically Condition B6, required that a BOMP be submitted within 12 months of the project approval. The BOMP must address impacts on the nine hectares of native vegetation located on Lamberts South, and on 31ha of rehabilitated vegetation.

It is understood that Lamberts North is currently available for use by Delta Electricity, while Lamberts South is likely to be unavailable for use by Delta Electricity for the next 25 years due to the expansion of Centennial Coal's Western Coal Services.

Biodiversity Offset Management Plan for Lamberts North

In our submission of 15th October 2010, OEH did not request a biodiversity offset for the five hectares of five year old regrowth to be impacted on Lamberts North.

The BOMP for Lamberts North concludes that, as the area has undergone mining activity, and is currently sparsely vegetated with regrowth established to rehabilitate the area (which will be

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systematically rehabilitated throughout the Ash Repository Project), there is no need to provide a biodiversity offset for this area.

Based on the information provided, OEH has no specific comment to make on the BOMP for Lamberts North.

Biodiversity Offset Strategy Outline for Lamberts South

As recognised in the document, the BOSO for Lamberts South does not constitute a BOMP as required by Condition 86.

OEH concurs with the findings of the Director-General's Environmental Assessment Report mentioned in section 2.2 of the BOSO that an offset ratio of 1:1 is not appropriate, and does not demonstrate an "improve or maintain" outcome. OEH supports the intent to use the BioMetric or similar methodology to calculate offset values when Lamberts South becomes available to Delta Electricity for ash placement.

Section 2.3 of the BOSO states that a BOMP for the Project will be submitted within six months of Delta Electricity acquiring access to Lamberts South. Given that this access may not be granted for 25 years, OEH recommends that Delta ensures that sufficient BioMetric data has been gathered for the area to be impacted to enable calculation of future offset requirements.

Should you require further information please contact Liz Mazzer, Conservation Planning Officer on (02) 6883 5325.

Yours sincerely,

R. Taylor

ROBERT TAYLOR
Manager, Environment and Conservation Programs
Regional Operations Group

NSW GOVERNMENT | Planning & Environment

Contact: Neville Osborne
Phone: (02) 9228 6337
Email: neville.osborne@planning.nsw.gov.au

Mr Peter Griffiths
Environment Manager Safety, Health and Environment
EnergyAustralia NSW
Mt Piper Power Station
350 Boulder Road
Portland NSW 2847

Dear Mr Griffiths

Mt Piper Ash Placement Project (MP09_0186) – Lamberts North Biodiversity Offset Management Plan - Condition B6

I refer to your letter dated 23 July 2015 which forwarded a revised Biodiversity Offset Management Plan (BOMP) for the Lamberts North site.

I note that EnergyAustralia proposes to rehabilitate an area of 6.7 ha adjacent to Thompsons Creek Reservoir, and that a range of management actions is set out in Table 8 of the BOMP, with initial revegetation commencing this year.

I also note that the BOMP has committed to legally protecting and managing this land in perpetuity. It is understood that EnergyAustralia is currently negotiating the best method of achieving this with the Office of Environment and Heritage (OEH).

The Department considers the BOMP adequately meets the requirements of condition B6 in relation to the Lamberts North site. Accordingly, the Secretary has approved the BOMP dated July, 2015. EnergyAustralia should advise the Department of the mechanism to be used to secure the site in perpetuity once agreed with OEH.

Please contact Neville Osborne on the above details if you would like to discuss this matter.

Yours sincerely

24.8.15.

Mike Young
Director
Resource Assessments
as nominee of the Secretary.

Planning & Environment 23-33 Bridge Street, Sydney NSW 2000 GPO Box 39, Sydney NSW 2001 Phone 02 9228 6111 Fax 02 9228 6455 Website planning.nsw.gov.au

Planning, Industry & Environment

Our ref: DOC19/812781
Senders ref: Project Approval 09_186

Mr Anthony Nolan
Senior Environment Officer
EnergyAustralia NSW Pty Ltd
350 Boulder Road
Portland NSW 2847

Dear Mr Nolan

Mount Piper Ash Placement project – Lamberts North Biodiversity Offset Management Plan

Thank you for your email dated 9 September 2019 seeking comments from the former Office of Environment and Heritage (OEH), now the Biodiversity and Conservation Division (BCD) of the Department of Planning, Industry and Environment (DPIE) on the updated Lamberts North Biodiversity Offset Management Plan (BOMP) for the Mount Piper Ash Placement project.

BCD has no specific comments to make on the updated Lamberts North BOMP. BCD notes that EnergyAustralia are committed to securing the offset site (known as Thompsons Creek Reservoir BOA) in perpetuity. BCD are happy to assist EnergyAustralia in determining what security mechanisms are available for this area through discussions with the Biodiversity Conservation Trust.

If you have any questions about this advice, please do not hesitate to contact Michelle Howarth, Conservation Planning Officer, via michelle.howarth@environment.nsw.gov.au or 02 6883 5339.

Yours sincerely

Peter Christie
Director
North West, Biodiversity and Conservation

17 September 2019

Planning & Assessment
Energy & Resources
Contact: Philip Nevill
Tel: (02) 8275 1036
Email: philip.nevill@planning.nsw.gov.au

Mr Antony Nolan
Senior Environment Officer
EnergyAustralia NSW Pty Limited

Via email: [redacted]

Dear Mr Nolan

Lamberts North Ash Placement Project (09_0186)
Biodiversity Offset Management Plan

I refer to your letter asking the Secretary to approve *Mt Piper Power Station Biodiversity Offset Management Plan Lamberts North Ash Placement Project* (Version 2.0).

The Department has carefully considered the plan, and is satisfied that you have addressed the comments which resulted from its review. Further, the Department considers that the strategy meets the requirements of condition B6 of project approval 09_0186.

Accordingly, the Secretary has approved *Mt Piper Power Station Biodiversity Offset Management Plan Lamberts North Ash Placement Project* (Version 2.0).

I would appreciate it if you could place the approved plan on the project website as soon as possible.

If you wish to discuss the matter further, please contact Philip Nevill on (02) 8275 1036.

Yours sincerely

19/12/19

Steve O'Donoghue
Director
Resource Assessments
as nominee of the Secretary

APPENDIX B

Thompsons Creek Reservoir BOA Monitoring Results

Table A- 1: Flora species recorded in the BOA

Family	Scientific Name	Species	Native/Exotic
Anthericaceae	*Laxmannia gracilis*	Slender Wire Lily	Native
Anthericaceae	*Tricoryne elatior*	Yellow Rush-lily	Native
Apiaceae	*Hydrocotyle laxiflora*	Stinking Pennywort	Native
Asteraceae	*Carthamus lanatus*	Saffron Thistle	Exotic
Asteraceae	*Cirsium vulgare*	Spear Thistle	Exotic
Asteraceae	*Euchiton sphaericus*		Native
Asteraceae	*Gamochaeta purpurea*	Purple Cudweed	Exotic
Asteraceae	*Gamochaeta* sp.		Exotic
Asteraceae	*Hypochaeris radicata*	Cat's Ears	Exotic
Asteraceae	*Senecio quadridentatus*	Cotton Fireweed	Native
Boraginaceae	*Cynoglossum australe*		Native
Caryophyllaceae	*Petrorhagia sp.*		Exotic
Casuarinaceae	*Allocasuarina littoralis*	Black She-oak	Native
Cyperaceae	*Baumea sp.*		Native
Cyperaceae	*Lepidosperma sp.*		Native
Dilleniaceae	*Hibbertia riparia*	Erect Guinea-flower	Native
Ericaceae (Epacridaceae)	*Leucopogon virgatus*		Native
Ericaceae (Epacridaceae)	*Lissanthe strigosa*	Peach Heath	Native
Fabaceae	*Pultenaea* sp.		Native
Fabaceae	*Bossiaea obcordata*	Spiny Bossiaea	Native
Fabaceae (Mimosoideae)	*Acacia dealbata*	Silver Wattle	Native
Genitaceae	*Centaurium sp.*		Exotic
Genitaceae	*Centaurium tenuiflorum*		Exotic
Geraniaceae	*Geranium solanderi*	Native Geranium	Native
Geraniaceae	*Geranium sp.*		Native
Juncaceae	*Juncus sp.*		Native
Lomandraceae	*Lomandra filiformis*	Wattle Mat-rush	Native
Lomandraceae	*Lomandra glauca*	Pale Mat-rush	Native
Lomandraceae	*Lomandra longifolia*	Spiny-headed Mat-rush	Native
Lomandraceae	*Lomandra sp.*		Native
Mrytaceae	*Eucalyptus sp.*		Native
Myrtaceae	*Eucalyptus bridgesiana*	Apple Box	Native
Myrtaceae	*Eucalyptus dives*	Broad-leaved Peppermint	Native
Myrtaceae	*Eucalyptus mannifera*	Brittle Gum	Native
Orchidaceae	*Pterostylis* sp.		Native
Oxalidaceae	*Oxalis sp.*		Native

Family	Scientific Name	Species	Native/Exotic
Phyllanthaceae	*Poranthera microphylla*		Native
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongue	Exotic
Plantaginaceae	*Veronica plebeia*	Creeping Speedwell	Native
Poaceae	*Agrostis sp.*	Bent Grass	Exotic
Poaceae	*Aira caryophyllea*	Silvery Hairygrass	Exotic
Poaceae	*Aira elegantissima*	Delicate Hairygrass	Exotic
Poaceae	*Anthoxanthum odoratum*	Sweet Vernal Grass	Exotic
Poaceae	*Austrodanthonia sp.*		Native
Poaceae	*Austrostipa bigeniculata*		Native
Poaceae	*Elymus scaber*		Native
Poaceae	*Microlaena stipoides*	Weeping Meadow Grass	Native
Poaceae	*Nassella trichotoma**	Serrated Tussock	Exotic
Poaceae	*Phalaris aquatica*	Phalaris	Exotic
Poaceae	*Rytidosperma racemosa*	Wallaby Grass	Native
Poaceae	*Rytidosperma* sp.		Native
Poaceae	*Poa sieberiana*	Snow Grass	Native
Poaceae	*Panicum effusum*	Hairy Panic	Native
Polygonaceae	*Acetosella vulgaris*	Sheep Sorrel	Exotic
Pteridaceae	*Cheilanthes sieberi*	Rock Fern	Native
Rosaceae	*Acaena echinata*	Sheep's Burr	Native
Rosaceae	*Rubus fruticosus* sp. aggregate*	Blackberry	Exotic

*Priority weed species (Central Tablelands Local Land Service, 2017)

Table A- 2: Fauna species recorded in the BOA

Scientific Name	Species	Classification
Crinia signifera	Common Eastern Froglet	Amphibian
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Bird
Acanthiza lineata	Striated Thornbill	Bird
Acanthiza nana	Yellow Thornbill	Bird
Acanthiza pusilla	Brown Thornbill	Bird
Acanthiza reguloides	Buff-rumped Thornbill	Bird
Acanthorhynchus tenuirostris	Eastern Spinebill	Bird
Alisterus scapularis	Australian King Parrot	Bird
Anas superciliosa	Pacific Black Duck	Bird
Aquila audax	Wedge-tailed Eagle	Bird
Cacatua galerita	Sulphur-crested Cockatoo	Bird
Chenonetta jubata	Australian Wood Duck	Bird
Colluricincla harmonica	Grey Shrike-thrush	Bird
Corcorax melanorhamphos	White-winged Chough	Bird
Cormobates leucophaeus	White-throated Treecreeper	Bird
Corvus coronoides	Australian Raven	Bird
Cracticus tibicen	Australian Magpie	Bird
Dacelo novaeguineae	Laughing Kookaburra	Bird
*Daphoenositta chrysoptera^*	Varied Sittella	Bird
Dicaeum hirundinaceum	Mistletoebird	Bird
Elseyornis melanops	Black-fronted Dotterel	Bird
Eolophus roseicapilla	Galah	Bird
Falco cenchroides	Nankeen Kestrel	Bird
Fulica atra	Eurasian Coot	Bird
Grallina cyanoleuca	Magpie-lark	Bird
Gymnorhina tibicen	Australian Magpie	Bird
Hirundo neoxena	Welcome Swallow	Bird
Lichenostomus leucotis	White-eared Honeyeater	Bird
Malurus cyaneus	Superb Fairy-wren	Bird
Microcarbo melanoleucos	Little Pied Cormorant	Bird
Pachycephala pectoralis	Golden Whistler	Bird
*Petroica phoenicea^*	Flame Robin	Bird
Philemon corniculatus	Noisy Friarbird	Bird
Platycercus elegans	Crimson Rosella	Bird
Platycercus eximius	Eastern Rosella	Bird
Rhipidura albiscapa	Grey Fantail	Bird
Rhipidura leucophrys	Willie Wagtail	Bird
Sericornis frontalis	White-browed Scrubwren	Bird
Smicrornis brevirostris	Weebill	Bird
Strepera graculina	Pied Currawong	Bird
Sturnus vulgaris	Common Starling	Bird
Sugomel niger	Black Honeyeater	Bird
Todiramphus sanctus	Sacred Kingfisher	Bird

Scientific Name	Species	Classification
Austronomus australis	White-striped Free-tailed Bat	Mammal
*Capra hircus**	Feral Goat	Mammal
Chalinolobus dwyeri^^	Large-eared Pied Bat	Mammal
Chalinolobus gouldii	Gould's Wattled Bat	Mammal
Chalinolobus morio	Chocolate Wattled Bat	Mammal
Macropus giganteus	Eastern Grey Kangaroo	Mammal
Macropus rufogriseus	Red-necked Wallaby	Mammal
Miniopterus orianae oceanensis^	Eastern Bent-winged Bat	Mammal
Nyctophilus spp.	Long-eared Bat	Mammal
*Oryctolagus cuniculus**	European Rabbit	Mammal
Scotorepens orion	Eastern Broad-nosed Bat	Mammal
Trichosurus vulpecula	Brush Tailed Possum	Mammal
Vespadelus darlingtoni	Large-Forest Bat	Mammal
Vespadelus vulturnus	Little Forest Bat	Mammal
Vombatus ursinus	Common Wombat	Mammal
*Vulpes vulpes**	Red Fox	Mammal
Elapidae sp.	Unknown Elapid Snake	Reptile

*Priority pest species (Central Tablelands Local Land Services, 2018)

^Threatened species listed under the NSW *Biodiversity Conservation Act 2016*

^^Threatened species listed under the NSW *Biodiversity Conservation Act 2016* and Commonwealth *Environment Protection Biodiversity Conservation Act 1999*