Mt Piper Ash Placement Project Lamberts North

Annual Environment Management Report

September 2020 – August 2021

Lamberts North Annual Environment Management Report

Name of Operation	**Mt Piper Ash Placement Lamberts North**
Name of Operator	**EnergyAustralia NSW**
Development Consent / Project Approval #	**09_0186**
Environment Protection Licence (EPL) #	**13007**
Water Access Licence (WAL) #	**10AL116411**
Water Supply and Water Use Approval #	**10CA117220**
AEMR start date	**1st September 2020**
AEMR end date	**31st August 2021**

I, Ben Eastwood, certify that this report is a true and accurate record of the compliance status of Mt Piper Ash Placement – Lamberts North for the period 1st September 2020 to 31st August 2021 and that I am authorised to make this statement on behalf of EnergyAustralia NSW.

Note:

a) The Annual Review is an 'environmental audit' for the purposes of section 9.39 of the Environmental Planning and Assessment Act 1979. Section 9.42 provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is Tier 3 monetary penalty.

b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement – maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents – maximum penalty 2 years imprisonment or a fine of 200 penalty units, or both).

Name of authorised reporting officer	**Ben Eastwood**
Title of authorised reporting officer	**NSW Environment Leader**
Signature of authorised reporting officer	
Date	**25/11/2021**

This report may be cited as:

EnergyAustralia NSW (2021) Lamberts North Annual Environmental Management Report September 2020 – August 2021. EnergyAustralia NSW, NSW Australia.

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1. Summary of compliance

EnergyAustralia NSW (EA NSW) owns and operates the Mt Piper Ash Placement Project (PA 09_0186), comprising two separate ash repositories including the Lamberts North Ash Repository (LNAR) and the Lamberts South Ash Repository (LSAR) in accordance with Project Approval 09_0186, granted by the Minister for Planning on 12 February 2012. Ash placement activities have only commenced within the LNAR, with no ash placement to date taking place within the LSAR. Therefore, this Annual Environment Management Report (AEMR) focuses on environmental performance at the LNAR over the September 2020 – August 2021 reporting period. The LNAR is located approximately 18 kilometres north-west of the city of Lithgow and is situated adjacent to the Mount Piper Ash Repository (MPAR) and 700 meters to the east of the Mt Piper Power Station (MPPS). The MPAR is authorised under a separate consent (DA 80/10060) and is not the subject of this report.

The AEMR has been prepared pursuant to Schedule 2, Condition E21 of the Project Approval 09_0186. The AEMR has been prepared in accordance with the NSW Government's Post-approval requirements for State Significant Mining Developments Annual Review Guideline dated October 2015.

A summary of the LNAR compliance achieved during the reporting period is provided in Table 1. No non-compliance was identified during the reporting period. An extended review of compliance with the Conditions of Approval (CoA) is presented in Appendix A.

The AEMR contains a summary of all monitoring carried out under the conditions of Project Approval 09_0186 during the reporting period. The groundwater and surface water monitoring carried out during the reporting period identified some elevated results above the surface water and groundwater environmental goals identified in the relevant sub-plans contained in the approved Lamberts North Ash Placement Project Operation Environmental Management Plan dated September 2019 (OEMP). These elevated results are most likely to be associated with other adjacent approved activities in the area. EA NSW is undertaking further investigations (independent investigation) into the elevated results observed from the surface and groundwater monitoring.

Table 1 Statement of compliance

Were all conditions of the relevant approval(s) complied with	
Project Approval #09_0186	**YES/~~NO~~**
Environment Protection License (EPL) #13007 [as they relate to LNAR activities]	**YES/~~NO~~**
Water Access License (WAL) #10AL116411	**YES/~~NO~~**

Table 2 Details on Non-Compliance

Relevant Approval	Condition No.	Condition Summary	Compliance Status	Comment	Section where addressed within AEMR
n/a	n/a	n/a	n/a	n/a	n/a

In assessing compliance with CoAs, the key for compliance assessment provided in Table 3 was used, in accordance with the NSW Government's Independent Audit Guideline.

Table 3 Compliance Status Key

Risk Level	Colour Code	Description
High		Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence.
Medium		Non-compliance with: • Potential for serious environmental consequences, but is unlikely to occur; or • Potential for moderate environmental consequences, but is likely to occur.
Low		Non-compliance with: • Potential for moderate environmental consequences, but is unlikely to occur; or • Potential for low environmental consequences, but is likely to occur.
Administrative non-compliance		Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions).
Compliant		The intent and all elements of the requirement of the regulatory approval have been complied with.

An acceptable standard of environmental performance has been achieved during the reporting period as evidenced by the following:

- Noise from the LNAR site was inaudible at sensitive receivers during the reporting period.
- Analysis of the air quality data indicates air quality emissions from the LNAR have been managed effectively during the reporting period and comply with CoA D3 (d) and E18.
- There were no incidents associated with the LNAR site that caused or threatened material harm to the environment at this time.

2. Introduction

2.1 Background

The MPPS comprises of two coal-fired steam turbine generators, with a generating capacity of 700 and 730 MW, built over two stages in 1992 and 1993. The power station (along with the MPAR) is located approximately 17 km northwest of Lithgow and five kilometer's east of Portland (**Figure 1**) and was originally authorised in 1990 by the Lithgow City Council (DA 80/10060). The approved footprint of the LNAR is adjacent to the MPAR, near the MPPS (

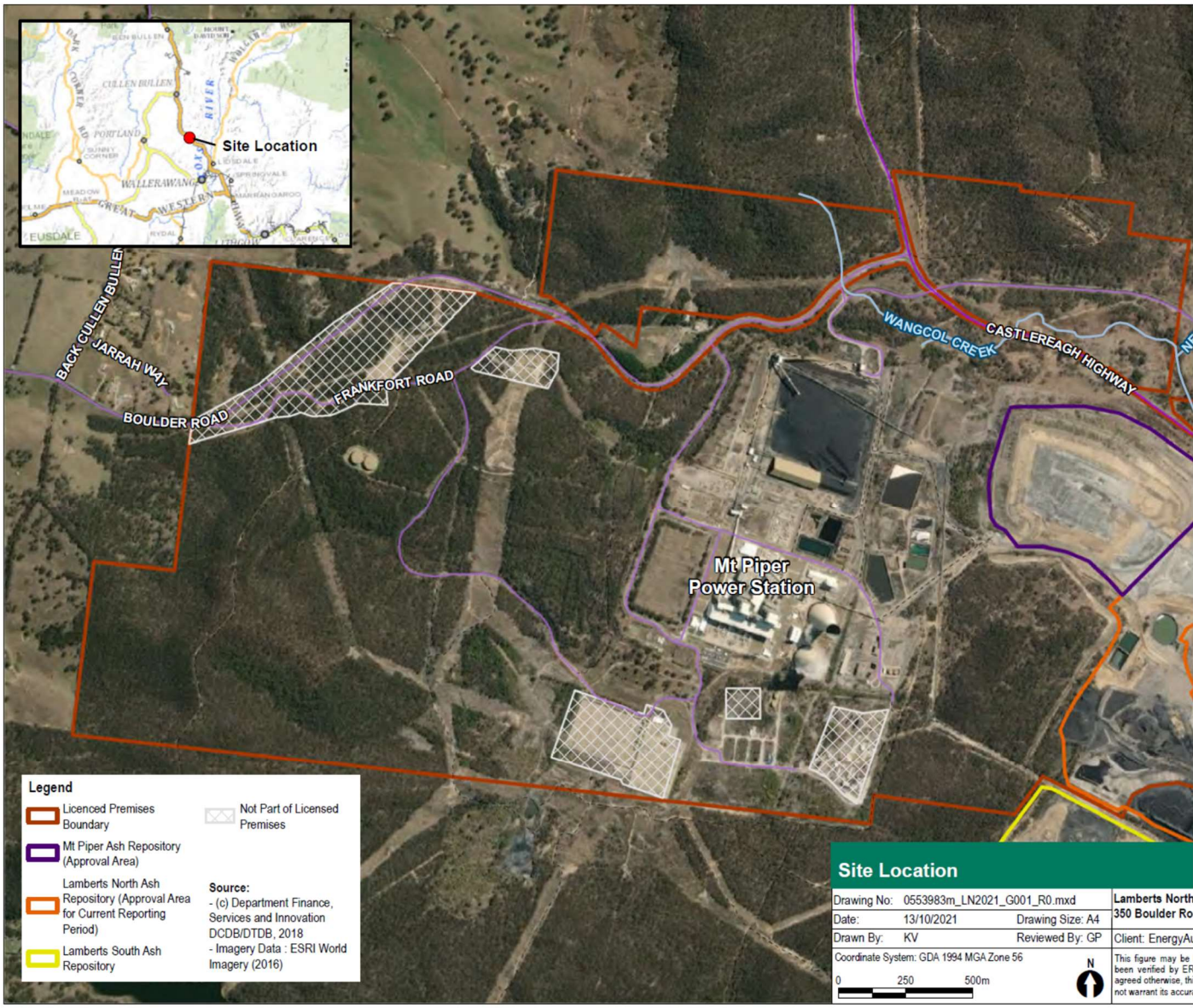

Figure 2). EA NSW acquired MPPS and associated land holdings and infrastructure from the state-owned Delta Electricity (DE) in September 2013.

Ash from the power station is placed in a dry ash repository (either MPAR or LNAR) as required. Approximately 680,000 m^3 of ash has been placed on an annual basis, depending on electricity demand and generation.

The AEMR specifically relates to the Lamberts North Ash Placement Project which authorises the operation of two separate ash placement areas referred to the LNAR and the LSAR.

The LNAR is the active ash placement area and this AEMR reports on the environmental performance associated with it over the 2020 – 2021 reporting period. The LSAR is yet to be constructed.

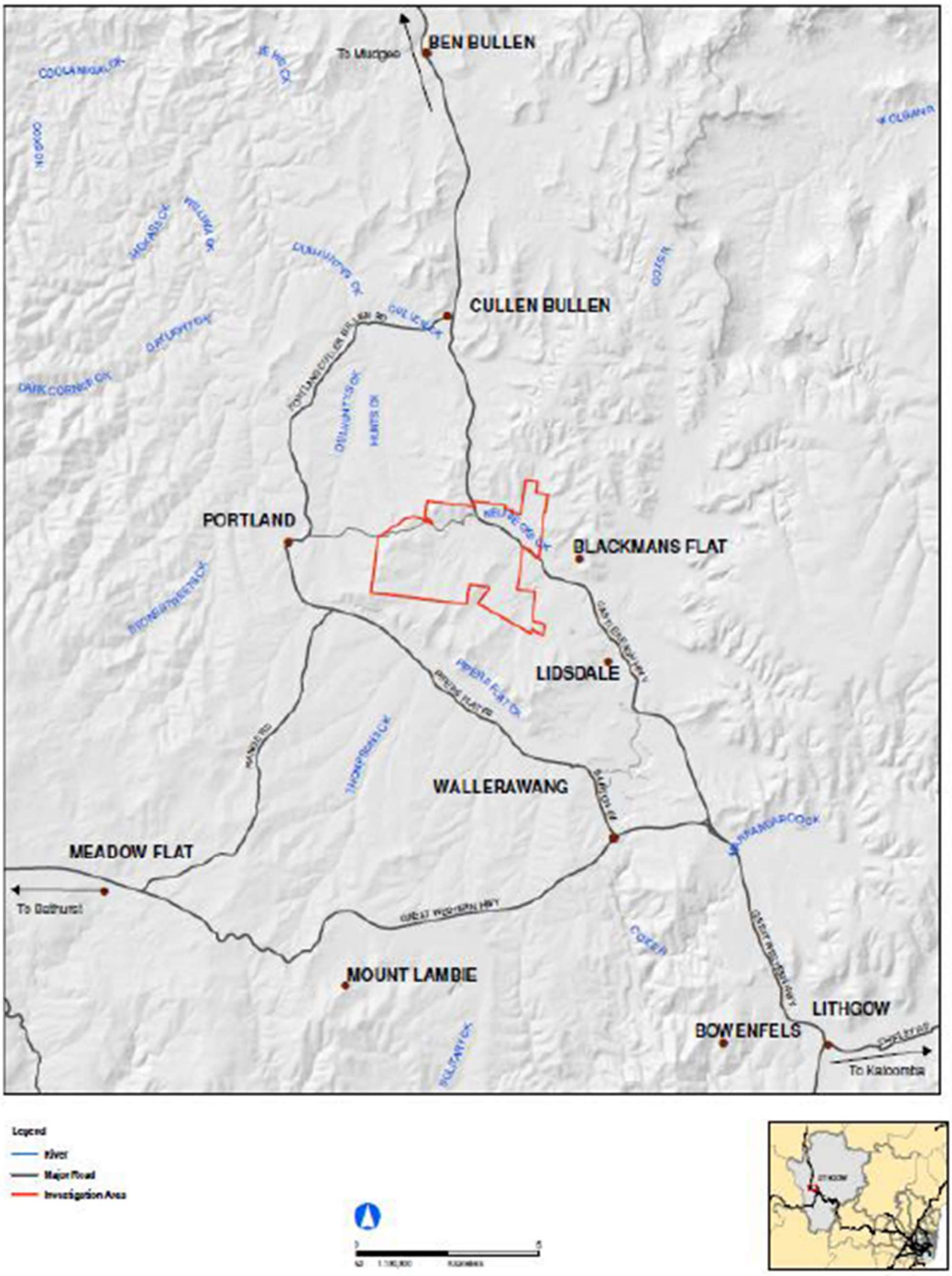

Figure 1 Regional context map

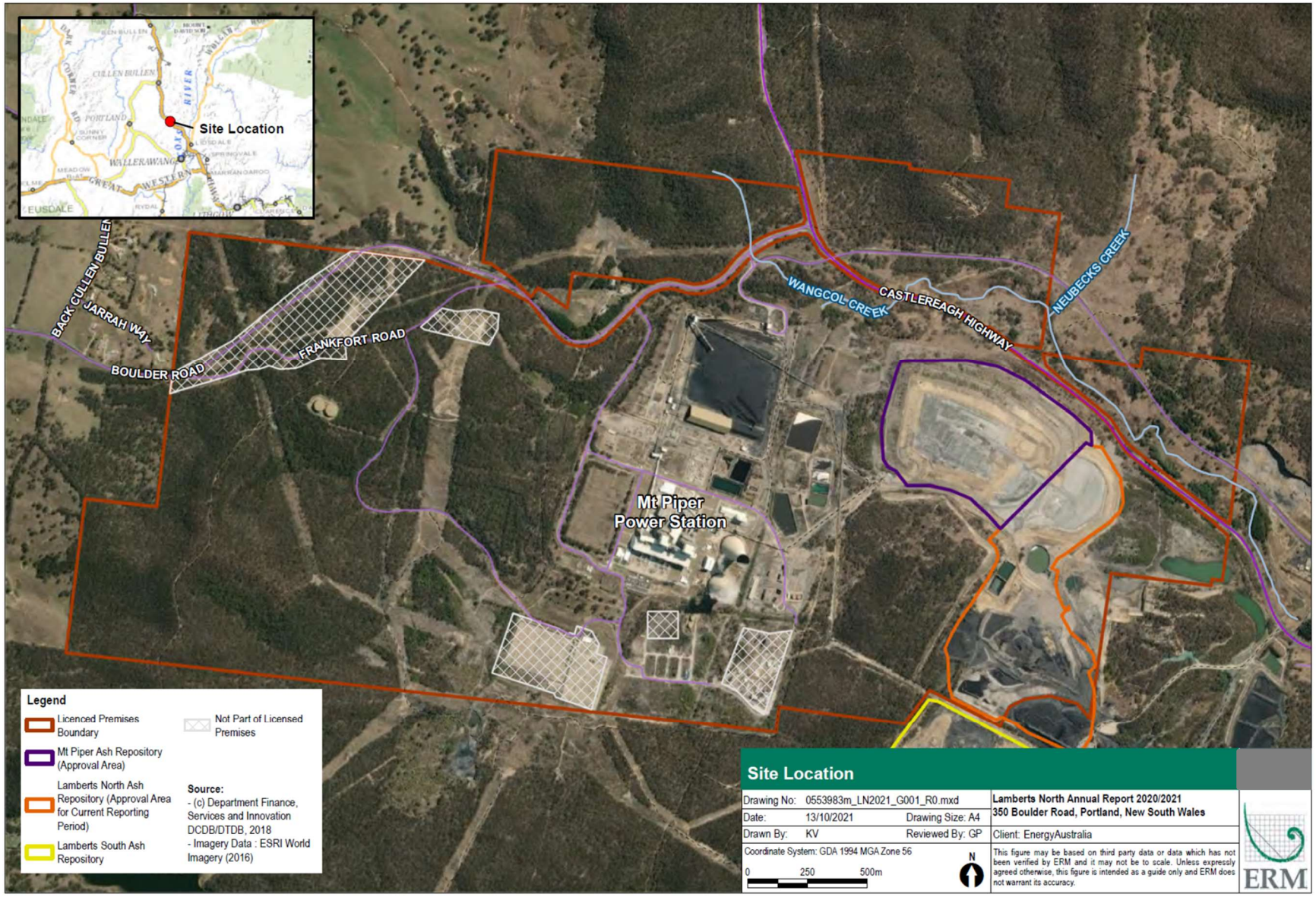

Figure 2 Site location

Report Title: Mt Piper Ash Placement Project Lamberts North Annual Environmental Management Report 2020-2021
Objective ID: A1959757

2.2 Purpose of the AEMR

The Project Approval (PA 09_0186) contains several conditions with which EA NSW needs to comply, as the proponent, at different stages of the Project (Section 3). Condition E21 of the Project Approval (DPI, 2012) requires that EA NSW prepare and submit an AEMR for the approval of the Secretary (formerly the Director-General), Department of Planning Industry and Environment (DPIE).

The AEMR is to include, but not necessarily be limited to:

- Review of project performance against the OEMP (required under conditions D2 and D3) and the Conditions of the Approval;
- Details of compliance with CoAs;
- A copy of the Complaints Register (refer to CoA B11) for the preceding twelve-month period (exclusive of personal details), and details of how these complaints were addressed and resolved;
- Identification of any circumstances in which the environmental impacts and performance of the project during the 12-month period have not been generally consistent with the environmental impacts and performance predicted in the documents listed under CoA A1, with details of additional mitigation measures applied to the project to address recurrence of these circumstances;
- Results of all environmental monitoring required under CoA, including interpretations and discussion by a suitably qualified person; and
- A list of all occasions in the preceding twelve-month period when environmental goals/objectives/impact assessment criteria for the project have not been achieved, indicating the reason for failure to meet the criteria and the action taken to prevent recurrence of that type of failure.

This AEMR has been prepared in order to satisfy CoA E21 of the Project Approval 09_0186 (DPI, 2012). This report covers the operations, environment and community performance of the LNAR from 1 September 2020 to 31 August 2021 (reporting period).

The report has been prepared in accordance with the NSW Government's *Post-approval requirements for State significant mining developments Annual Review Guideline.*

2.3 Project contacts

The contact details for LNAR are listed in Table 4

Table 4 Lamberts North Ash Placement Contact

Contact Person	Position	Telephone
Ben Eastwood	NSW Environment Leader	(02) 63548111

3. Consents, Leases and Licences

This AEMR has been prepared to address the relevant conditions of PA 09_0186 and the Statement of Commitments (SoC) which have been triggered during the reporting period. The operation of the LNAR must comply with the following statutory requirements (Table 5):

Table 5 Key Consents, Leases, Licenses and Permits

Approval/Lease/Licence	Issue Date	Expiry Date	Details/Comments
Project Approval 09_0186	16 February 2012	-	Granted by the Minister for Department of Planning and the Environment (DPE), under Section 75J of the Environmental Planning and Assessment Act (EP&A Act).
Environment Protection License (EPL) No. 13007	17 August 2020		EPL held by EA NSW for MPPS, granted by the Environment Protection Authority (EPA), under Section 55 of the Protection of the Environment Operations Act (POEO Act).
Water Access Licence No. 27428 (WAL)	28 February 2014	-	Granted by Department of Primary Industries-Water (DPI-Water), under the Water Management Act 2000
Water Supply Work and Water Use Approval 10CA117220	28 February 2014	-	Granted by DPI-Water, under the Water Management Act 2000

A summary of compliance against the applicable statutory requirements is provided in Section 1.

3.1 Operations Environmental Management Plan

The OEMP provides the framework to manage the environmental aspects associated with the operation of the LNAR. The OEMP (EA NSW, 2019a) outlines the requirements associated with the project as stipulated in the relevant provisions of the Project Approval 09_0186 issued by the now DPIE, the EPL 13007 issued by the NSW EPA, and the SoC presented in the Submissions Report (SKM, 2011).

The scope of the OEMP covers the operations involving the movement and placement of ash from MPPS to LNAR. The environmental performance against the OEMP is provided in Sections 6 – 10.

3.2 Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) for the LNAR was developed in consultation with EA NSW's Western Environment Section and approved by the then DPIE in December 2012. The CEMP meets the requirements of CoA B4, providing the framework to manage the environmental aspects associated with construction works during LNAR operations. The CEMP has been prepared to address the requirements associated with the project as stipulated in the relevant provisions under Project Approval 09_0186 issued by the DPIE (CDM Smith, 2012a). There were no construction activities undertaken throughout the reporting period.

4. Operations during reporting period

Ash placement operations for MPPS, including LNAR, are undertaken by contracted specialists in the handling and management of ash. Lend Lease is the current service provider for EA NSW in regard to ash and dust management associated with the repository. The LNAR is currently managed under an 'operate and maintain' contract.

A summary of operations at the LNAR within the reporting period can be found in Table 6. It is noted that there will be an increase in ash delivered to the LNAR. This is due to the MPAR approaching its approved capacity, but will ultimately depend upon actual electricity generation.

Table 6 Operations Summary

Activity	Previous reporting period	This reporting period	Next reporting period
Fly Ash delivered (T)	0	157,500	450,000*
Total ash produced at MPPS (T)	672,002	827,096	750,000*
Total Ash Footprint (ha)	16.7	16.7	16.7†
Area of repository capped (ha)	1.3	1.3	1.3†

† Estimate figure based on current year. *Figure based on average of previous years.

4.1 Normal operating hours

The normal hours of operation for the Project are between 6 am and 8 pm Monday to Friday, and 6 am to 5 pm Saturday and Sunday in accordance with CoA E1. Operations outside these hours are defined as abnormal or emergency operating conditions and are subject to specific requirements in accordance with E2 (Section 2.2.2 OEMP).

4.2 Abnormal or emergency operating conditions

Conditions under which operations outside the normal hours of operation can occur have been specified in the Project Approval and can be described as follows:

- Where it is required to avoid the loss of lives, property and/or to prevent environmental harm; or
- Where a breakdown of plant and/or equipment at the repository or the MPPS and the MPPS Extension project with the effect of limiting or preventing ash storage at the power station outside the normal operating hours Condition E1 (Section 3.1 OEMP).
- Where a breakdown of an ash haulage truck(s) or the conveyor belts prevents haulage during the operating hours stipulated under Condition E1 combined with insufficient storage capacity at MPPS to store ash outside of the normal operating hours; or
- In the event that the National Electricity Market Management Company (NEMMCO), or a person authorised by NEMMCO, directs EA NSW (as a licensee) under the National Electricity Rules to maintain, increase or be available to increase power generation for system security and there is insufficient ash storage capacity at the MPPS to allow for the ash to be stored.

Under these circumstances, EA NSW is required to notify the EPA, and nearby sensitive receivers prior to any emergency ash haulage or placement operations outside of the '*normal operation*' hours, and the Security of the DPIE within 7 days after the emergency operations have occurred.

No abnormal or emergency operating conditions occurred during the reporting period that required activities to be undertaken outside of the normal operating hours during the reporting period.

4.3 Activities conducted during the current reporting period

The following activities were undertaken during the reporting period:

- 157,500 tonnes Fly Ash placed in the LNAR for the reporting period.
- Mt Piper Ash Management Strategy update indicating that EA NSW had met 40% ash re-use target by December 2020 was approved by the DPIE.
- Submission of an application for a Conservation Agreement for the Thompsons Creek Reservoir Biodiversity Offset Area (BOA): March 2021.
- A site visit was held with the Biodiversity Conservation Trust (BCT) to discuss the development of the Conservation Agreement for the Thompsons Creek Reservoir BOA: April 2021.
- EA NSW review and finalisation of the Conservation Agreement for the Thompsons Creek Reservoir BOA: June-August 2021
- MP 09_0186 Mt Piper Ash Placement LNAR Modification (LNAR Mod 1) submitted to DPIE. Modification of PA 09_0186 relates to the installation of a leachate barrier and leachate management system to better manage brine conditioned ash.
- Public exhibition of LNAR Mod 1 in May-June 2021.
- LNAR Mod 1 Response to Submissions Report submitted to DPIE.
- Draft LNAR Mod 1 conditions received from DPIE.

5. Actions required from previous AEMR review

Table 7 Actions required from last AEMR

Item	Action required from 2020 AEMR	Requested by	Action taken	Status	Where discussed in AEMR
1	*Upload a copy of the Annual Review to the EnergyAustralia website.*	DPIE	Annual Review uploaded onto EA website 17th December 2020.	C	5

6. Environmental management and performance

Environmental monitoring of the operations at LNAR is designed to comply with the regulatory requirements specified in Section 3 of the AEMR, and to provide an ongoing analysis of the condition of the environment surrounding the operations. Environmental monitoring is performed at the sites indicated within Figure 3 and the results are used to determine the effectiveness of the environmental controls and management practices at the LNAR.

Detailed procedures outlining the environmental monitoring responsibilities of key stakeholders and the impacts to be mitigated are described in the relevant sub-plans of the OEMP. Details regarding the environmental responsibilities, key stakeholders and the impacts to be mitigated regarding construction activities are described in the CEMP. A summary of the environmental management measures and associated performance are provided in Table 8.

Table 8 Environmental Performance

Aspect	Approval Criteria / EIS prediction	Performance during reporting period	Trends / Management Implications	Management Actions
Noise	Criteria day 42 dB(A) Evening 38 dB(A) Night 35 dB(A)	Compliant	No change from previous years	No action required
Air Quality	PM10 annual <30ug/m^3 24 hour <50ug/m^3 Depositional dust Increase in total 2g/m^2/month to maximum of 3.5g/m^2/month	Compliant	PM_{10} results reflective of background conditions and below the daily standard limit for entire reporting period. Minor decrease in depositional dust trends	No additional action required
Biodiversity	Submit a biodiversity offset plan for approval	Compliant	The 2017 revegetation works continue to establish. Direct seeding work and biennial flora & fauna monitoring completed in 2020	Continue ecological monitoring and management in accordance with the biodiversity offset plan

Performance against contract requirements is provided by Lend Lease as a monthly Client Service Report (Lend Lease, 2020; 2021) and through external consultant and internal data and reports. Summaries of these reports are provided in the sections below (6.1 – 6.7) and in Appendix C-F.

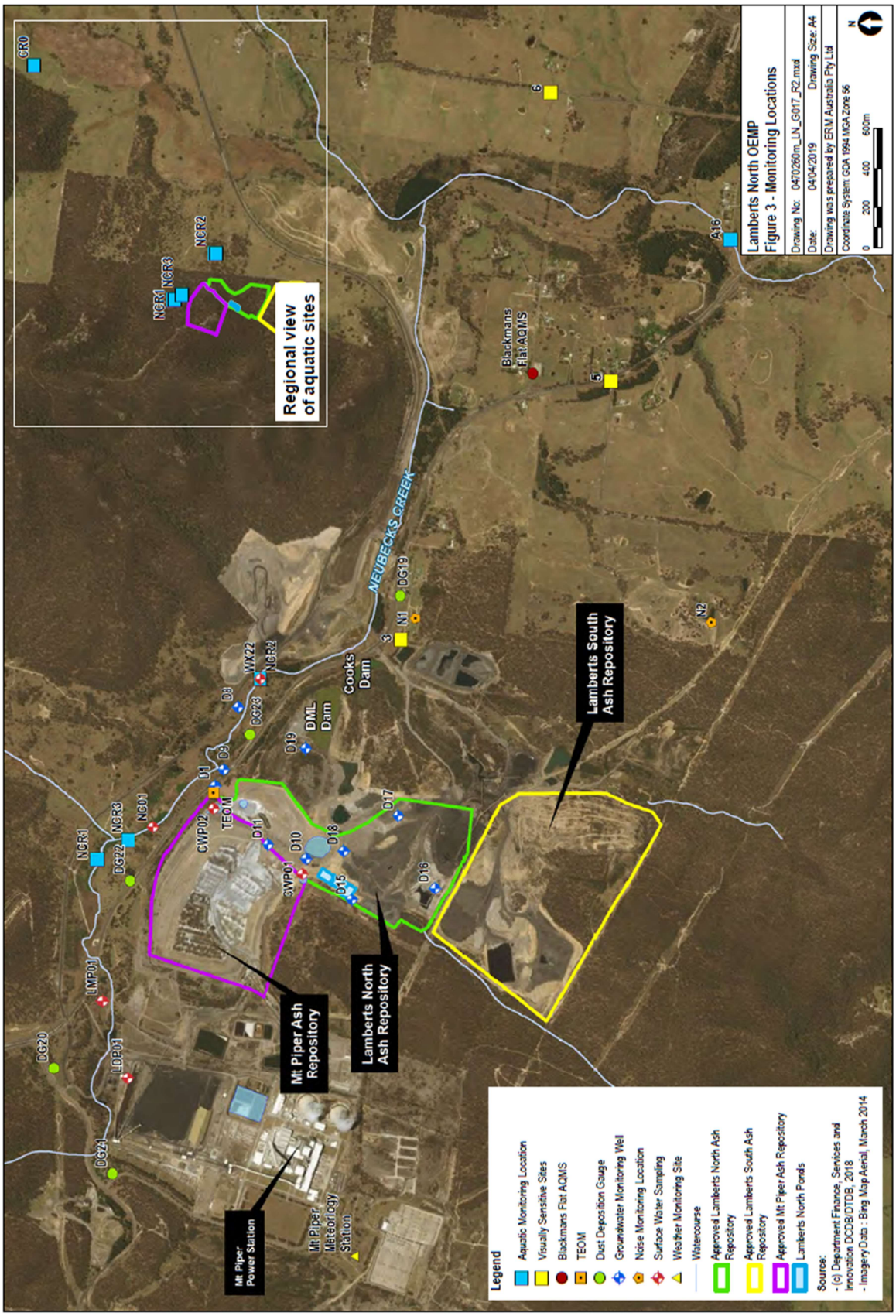

Figure 3 Environmental monitoring locations

6.1 Ash delivery and placement

6.1.1 Environmental Management

Ash generated as a by-product from the operation of MPPS is transported by conveyer from the MPPS to ash silos at the MPAR as part of the existing approved operations. Ash is then transported by heavy haulage vehicles (generally one to two trucks) from the silos to either the MPAR, or the LNAR. Transport to LNAR is facilitated via the southern boundary haulage road in the existing ash repository. On delivery to the LNAR, the water conditioned ash is deposited at the working face where compactors and bulldozers are then used to place the ash in stable landforms with appropriate drainage infrastructure. Ash placement can be broadly described as including the following processes (see also Figure 4):

- Identifying the current operational location for placement of ash.
- Placing ash at the existing face using truck and shaping of ash with a bulldozer.
- The ash is treated to achieve an average compaction of 95%, relative to its maximum standard compaction, through controlled combination of water addition and machine compaction with the use of rollers and rubber-tyred vehicles.
- Ash is placed in layers and stepped to produce an overall batter slope of approximately 1(V):4(H), with benches added every 10 m in vertical height change. This process of ash placement produces an average batter length of 40 m.
- The sequence of ash placement will entail initially placing ash across the site starting from the most northerly part, then towards the east and south of LNAR, working to reach a final design height of 980 metres (m) Australia Height Datum (AHD) through abutment with the MPAR.
- Boundary faces are sequentially covered with material to be sourced from locally available material. Once the cover material is placed, vegetation replanting and restoration activities are undertaken. The process is repeated until LNAR is filled to its maximum permissible height and extent.
- Ash will be placed to the desired height (0.5 m to 1 m lifts) in pads, with materials that have been moisture-conditioned with water placed in the lower layers to an elevation as specified in approved design drawings, with corresponding heights of 10 m.
- Methods for the placement of ash materials to optimise compaction and stability of the emplacement areas include target moisture contact, compaction density, and progressive capping and vegetation.

Capping of exposed ash areas has been undertaken progressively as LNAR reaches its approved design height. Progressive revegetation of batters will commence once the final perimeter batters are constructed and keyed into the adjoining MPAR.

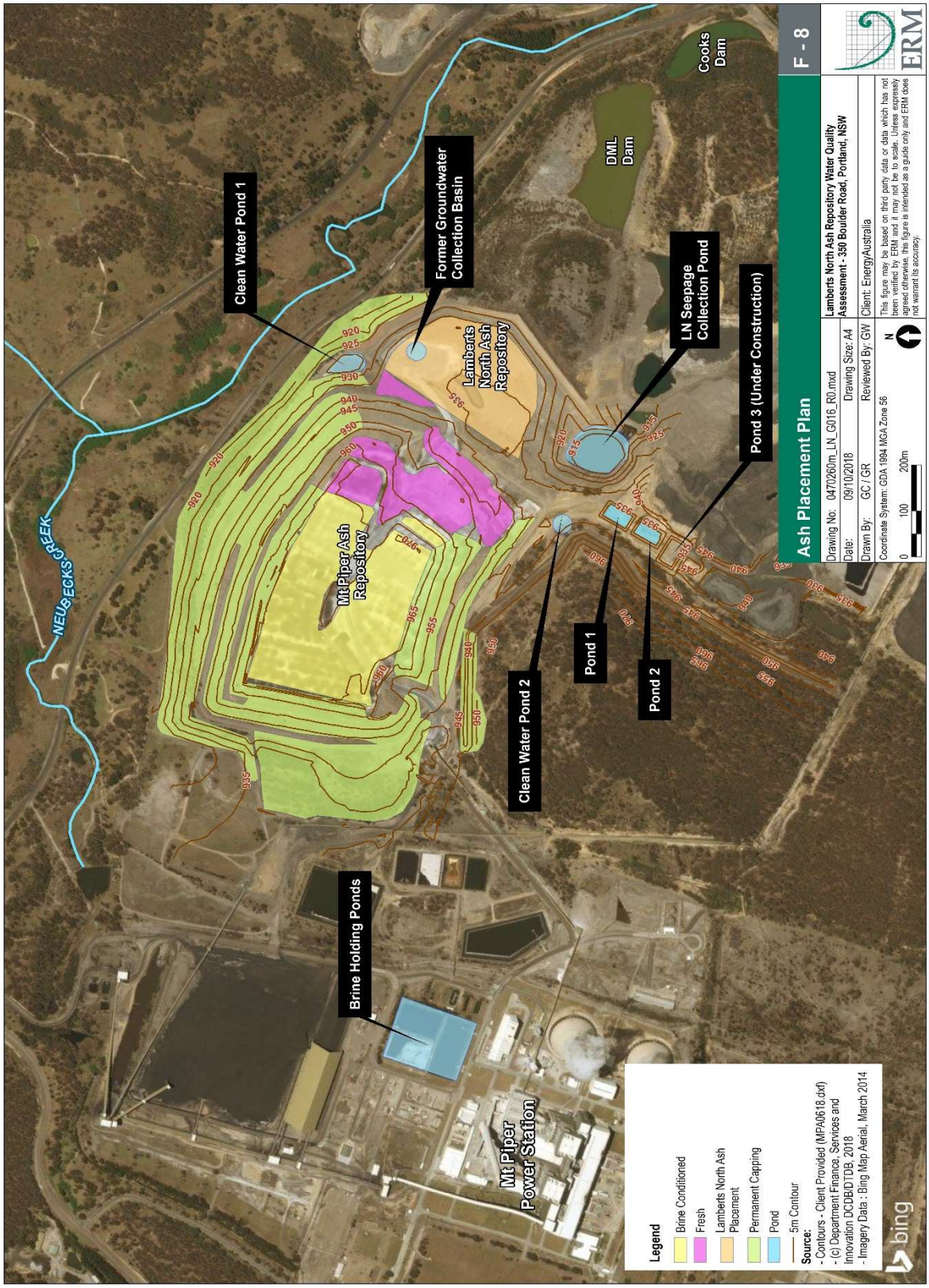

Figure 4 Ash Placement Plan

6.1.2 Environmental Performance

During the reporting period, 157,500 tonnes (T) of water-conditioned fly ash has been placed in LNAR. Temporary stockpiles of bottom ash are stored on LNAR prior to being sold or reused to upgrade roads on the ash repository. Up to 104,720 tonnes of fly ash has been diverted from emplacement for recycling and use in cement production.

NuRock have completed a pilot plant testing of the MPPS produced ash as the main constituent for their products and are moving into the first production phase. NuRock have an approved Development Application from Lithgow City Council and have been granted an EPL from the EPA.

Inspections on the ash repository are performed on a monthly basis by the contractor and the results are summarised in Appendix B. The management and mitigation measures specified in the approved OEMP were found to be complied with.

6.1.3 Reportable Incidents

No reportable incidents have been recorded against ash delivery and placement for the reporting period.

6.1.4 Further Improvements

- Continue to support NuRock with the development of its business on-site to reuse fly ash.
- Continue to market the reuse of fly ash to cement manufacturers.
- Support a new negotiation for further use of fly ash.

6.2 Operational Noise Monitoring

6.2.1 Environmental Management

The LN Operational Noise Management & Monitoring Plan (ONMMP) has been developed to address the specific requirements of the CoA D3(a) and E7 to E14 for the Project. The ONMMP provides the framework to manage operational noise emissions and minimise potential noise impacts to sensitive receivers during the operation of the Project. The level of noise received by a sensitive receiver will depend on the location of the receiver, the type and duration of works and intervening topography, and existing building structures between the noise emission source and receiver.

The residential community of Blackmans Flat is located to the east of the private haul road and ash repository site. The following residential properties, located within 1100 m from LNAR, have been identified as the nearest potentially affected sensitive receivers to noise from the repository site (Table 9):

Table 9 Representative noise measurement locations

Sensitive Receiver	Distance to Haulage Road (m)
1. Blackmans Flat (east of Lamberts North)	1100
2. Blackmans Flat (west of Castlereagh Highway)	1100

During the reporting period compliance monitoring was conducted in April 2021 during the early morning and evening periods as per the requirements outlined in the ONMMP. The applicable operational noise criteria are outlined in the Project Approval (No. 09_0186), the OEMP and ONMMP. The criteria are summarised as follows:

The cumulative operational noise from the ash placement area and ash haulage activity shall not exceed a $L_{Aeq\ (15\ minute)}$ dB(A) as defined in condition E7 and identified in Table 10.

Table 10 Operational Noise Criterion (LAeq(15 minutes) dB(A))

Location	Day (7 am – 6 pm)	Evening (6 pm – 10pm)	Night (10 pm – 7 am)
All private sensitive receivers within the township of Blackmans Flat	42	38	35
Blackmans Flat (west of Castlereagh Highway)	42	38	35

This criterion applies under all meteorological conditions except for any of the following:

a) Wind speeds greater than 3 m/s at 10 m above ground;

b) Stability category F temperature inversion conditions and wind speed greater than 2m/s at 10m above ground level; and

c) Stability category G temperature inversion conditions.

6.2.2 Environmental Performance

Global Acoustics was engaged by EA NSW to carry out independent operational noise monitoring for the LN Project (Global Acoustics, 2021). The noise measurements were performed in April 2021 (Appendix C). Noise monitoring was performed in accordance with the methods described in the approved ONMMP.

The results of the measured noise levels at the sensitive receivers stipulated in the CoA (Location 1 and Location 2) can be found in Appendix B. The maximum 15-minute daytime equivalent sound pressure levels (LA_{eq}) at both the receiver locations were dominated by Castlereagh Highway traffic noise. Other noted noise sources were insects, birds, a nearby creek, other industrial operations, domestic and nocturnal animal activity. These measured equivalent sound pressure levels were in excess of the noise targets set for LNAR. However, it is not possible to conclusively determine the noise contribution from operational ash placement activities at LNAR at Locations 1 and 2 due to presence of other surrounding simultaneous noise sources and activities.

To quantify the likely noise contribution from the LNAR activities at Locations 1 and 2 from the LNAR, calculations were undertaken to estimate the noise emissions. The measurements are based on a worst-case operational scenario at both assessment locations and include adjustments for activities as outlined in Fact Sheet C of the EPA's *Noise Policy for Industry* (EPA, 2017).

Based on the worst–case noise modelling predictions undertaken, the noise resulting from the operations at the LNAR are below the $LA_{eq(15min)}$ 42dBA CoA criterion and are therefore deemed to comply with the OEMP (and PA 09_0186) at the representative residential receivers Location 1 and Location 2 (Table 12). The distances shown in Table 11 are considered minimum between the operational works and the respective receiver zones.

Table 11 Summary of Cumulative Noise Emissions against the Noise Criteria (dBA)

Location	Description	Maximum predicted noise	Day limit 42 dBA (07:00-18:00)	Evening limit 38 dBA (18:00-22:00) ^	Night limit 35 dBA (22:00-07:00) ^
1	Blackmans Flat (approx. 1.4km)	31	Compliant	N/A	N/A
2	Wallerawang (approx. 2.5km)	Inaudible	Compliant	N/A	N/A

Global Acoustics were also engaged to determine the sound power level (SPL) for a selection of mobile plant and equipment in operation at LNAR. Plant and equipment used at LNAR are required to meet typical SPLs as per manufacturing standards and the LNAR OEMP requires SPLs be tested following any ongoing noise complaints.

Despite there being no noise complaints in the 12 months prior, SPL testing was undertaken as due diligence in April 2021 (Appendix D). The SPLs were determined for the following pieces of machinery and conditions and are recorded in Table 12:

Komatsu Excavator – dynamic simulated loading test, operating at high-idle with uncontrolled engine cooling fan.

Komatsu Bulldozer – stationary test, operating at high-idle with uncontrolled engine cooling fan;

- Dynamic 1st gear forward test, operating at high-idle with uncontrolled engine cooling fan; and
- Dynamic 1st gear reverse test, operating at high-idle with uncontrolled engine cooling fan, reverse alarms disconnected.

The tests assume that each item of equipment is operating at maximum capacity (i.e. maximum sound power level). In reality, the mobile plant operates at much lower capacity during its operation and hence the levels shown in Table 12 are considered conservative and should be interpreted as indicative worst case only.

Table 12 Sound Power Levels for Equipment at Lamberts North

Equipment tested	Test condition	Sound Power Levels (SPL), dB	
		SPL*	Weighted SPL
Excavator	Dynamic simulated	116	108
Dozer	Stationary	115	103
	Dynamic 1st gear forward	116	108
	Dynamic 1st gear reverse	117	110
*Measured as 10 times the logarithmic ratio of power of a source relative to a reference level of one picowatt.			

6.2.3 Reportable Incidents

No reportable incidents have been recorded against operational noise for the reporting period.

6.2.4 Further Improvements

No further improvements have been identified for the next reporting period.

6.3 Biodiversity Offset Area (BOA)

An area of land adjacent to Thompsons Creek Reservoir has been identified as a suitable BOA for LNAR (refer to Figure 5). In confirming the BOA, various government and community organisations were consulted 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 which is owned and operated by EA NSW for water storage purposes. The BOA is bounded by EA NSW landholdings except for private landholdings along the southern boundary.

The Biodiversity Offset Management Plan (BOMP) (EA NSW, 2019b) details the management actions to be performed within the BOA to enhance habitat for native flora and fauna species through site rehabilitation and revegetation. Biennial, i.e. two-yearly, flora and fauna monitoring within the BOA is required to be performed in accordance with the BOMP.

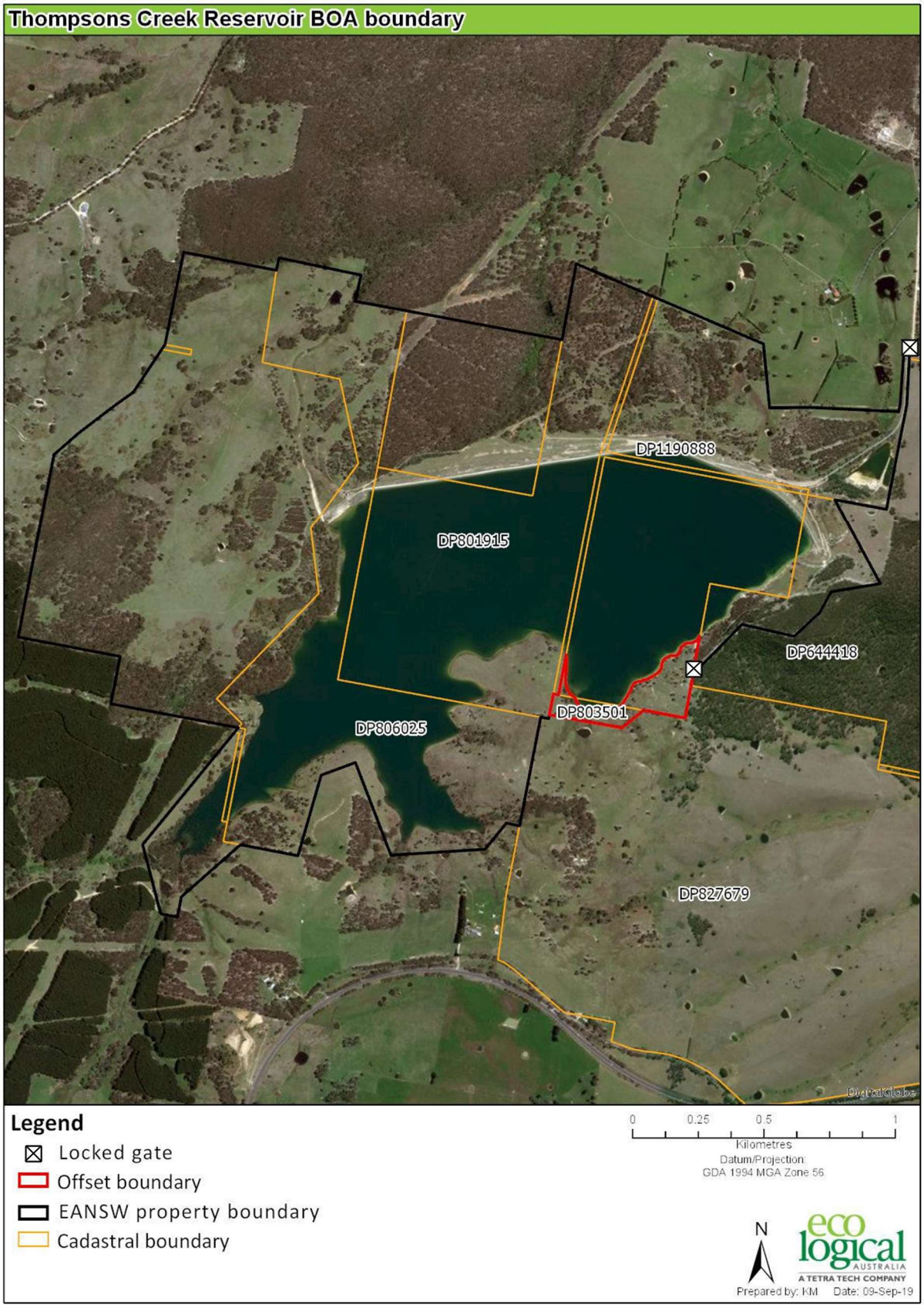

Figure 5 Biodiversity Offset Area

6.3.1 Environmental Management

Revegetating works were undertaken across the BOA in 2017, with approximately 2,000 seedlings planted across a 1 ha (approximate) section of the BOA (Plate 1). To improve the native vegetation connectivity in the BOA, EA NSW engaged a contractor in October 2020 to undertake direct seeding works in areas devoid of native tree cover after the required flora and fauna monitoring was performed. A total area of 1.5 hectares was directly sown with a tree, shrub, and groundcover seed mixture in Spring 2020 (Plate 2). An exclusion zone of 30-40 meters from the Thompson Creek Reservoir high-water level was created to maintain access along the foreshore for recreational fishing activities. Management of the revegetation works during the reporting period included the replacement of fertiliser tablets and regular watering.

Plate 1 Established species from revegetation undertaken in 2017 (Photo taken April 2021).

Plate 2 Area ripped for direct seeding (Photo taken October 2020).

EA NSW are committed to securing the Thompsons Creek Reservoir BOA in perpetuity. Guidance was sought from the Biodiversity Conservation Trust (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. An application for a Conservation Agreement was submitted to the BCT in March 2021. This was followed by a site visit with BCT representatives in April 2021 (Plate 3). BCT provided EA NSW with a

draft Conservation Agreement in June 2021. EA has provided feedback to the BCT and execution of the Conservation Agreement by EA NSW and the BCT is currently underway.

Plate 3 BCT and EA NSW Site Visit (Photo taken April 2021).

Eco Logical Australia (ELA) was engaged by EA NSW to perform the biennial flora and fauna monitoring within the BOA. The monitoring was performed in September 2020 in accordance with the requirements within the BOMP (Appendix E). The 2020 monitoring event reported an increase in species diversity for both native and exotic species, native groundcover and total successfully established seedlings. It is highly likely that these results were influenced by the above average rainfall experienced in the months preceding the monitoring, following drought conditions recorded during the 2018 monitoring period (ELA, 2018; 2020). The assessment of the revegetation works also found that the plantings have continued to develop with species composition and stem density characteristic of a native locally occurring woodland. Eucalypt species were the most successful establishers, which included key canopy species characteristic of the surrounding vegetation communities. Three species listed as priority weeds under the *Central Tablelands Regional Strategic Weed Management Plan 2017-2022* (LLS, 2017), i.e. Blackberry, Serrated Tussock and St John's Wort, were recorded during the 2020 monitoring event.

Overall bird species richness showed an increase with 37 species recorded overall in 2020, compared to 26 species recorded during both 2016 and 2018. Overall bird species richness included seven species of previously unrecorded native woodland birds, including the threatened Glossy Black-Cockatoo and more common species such as Red Wattlebird. No reptile species were recorded (opportunistically) throughout the 2020 monitoring. However, at present, there is limited habitat available for reptile and other ground-dwelling fauna in the form of large-woody debris or surface rock. The presence of introduced pest species European Rabbit were recorded during the 2020 monitoring, which will require management in accordance with the BOMP in order to reduce potential grazing pressure on the recent direct seeding revegetation works from this species.

The next flora and fauna monitoring period is scheduled for Spring 2022, with the results to be included in the 2023 AEMR.

6.3.2 Reportable Incidents

No reportable incidents have been recorded against the BOA for the reporting period.

6.3.3 Further Improvements

- Perform targeted herbicide treatment of the three listed weed species (Blackberry, Serrated Tussock & St John's Wort) recorded during the Flora & Fauna Monitoring.
- Perform manual removal of Blackberry post-herbicide treatment to avoid the potential of re-shooting.
- Control of European Rabbit recommended to minimise grazing pressure on recent direct seeding.
- Complete execution of the Conservation Agreement with BCT for the BOA.

6.4 Ecological Monitoring

6.4.1 Environmental Management

The Ecological Monitoring Program (EMP) of the OEMP seeks to address the specific requirements of the CoA. The EMP provides for the requirements for the monitoring of aquatic ecology, in particular macro-invertebrates' aquatic habitat in accordance with CoA B7. EA NSW will maintain the EMP for a minimum of five years after the final capping of the LNAR in accordance with approval conditions.

The EMP was implemented in November 2012 prior to construction activities and then during construction in April 2013. In November 2020, the sample sites included in the program were, NCR1 downstream of surface water discharge point, NCR2 which is downstream of the gauging site (WX22), NCR3 on Wangcol Creek upstream of LN and Control A16 on the Cox River downstream of the confluence with Wangcol Creek (Figure 6). The EMP aims to monitor and quantify the impacts on the ecology of Wangcol Creek and the associated riparian environment.

The specific objectives of the 2020-2021 study were to:

- Sample indicators of ecological health in Wangcol Creek potentially affected by the Project and at unaffected control sites on the creek and on the Coxs River in Spring 2020
- Compare the findings with those of previous studies also undertaken in Spring as part of the EMP
- Assess whether any impacts to the aquatic ecology of Wangcol Creek occurred since the last Spring survey (in December 2018) and determine whether any such impacts were attributable to the Project; and
- Provide recommendations on any actions, if any, that may be required to minimise, mitigate or ameliorate any impacts to aquatic ecology that may have occurred and on any refinements to subsequent monitoring events that would improve the efficacy of the EMP.

Figure 6 Aquatic ecology monitoring sites and long-term water quality monitoring sites.

6.4.2 Environmental Performance

EA NSW engaged Cardno to conduct the EMP in accordance with the requirements of the OEMP. The assessment of aquatic habitat, water quality and macroinvertebrate assemblages was undertaken on 18 November 2020 during the Spring sampling season (Appendix F).

The biotic indices used in the monitoring program include the total number of taxa, number of pollution sensitive taxa (EPT), taxa score (OE50) and SIGNAL2 index to determine whether any changes to macroinvertebrates due to the Project have occurred.

There was no evidence in the Spring 2020 data that would suggest an impact due to the Project (Cardno, 2021). In particular, there was no evidence of a change in SIGNAL2 score in Spring 2020 following the apparent reduction in this indicator reported in the Autumn 2020 report (Cardno, 2020). The apparent elevations in electrical conductivity and concentrations of some metals that occurred in Wangcol Creek in early 2020, following a few months of low rainfall and flow, did not appear to have affected macroinvertebrate indicators sampled later in the year (i.e. Spring 2020).

The OE50 Taxa Score sampled in Spring at NCR1 has ranged from 0.36 to 0.95, 0.43 to 1.04 at NCR2, 0.19 to 0.85 at NCR3 and 0.36 to 0.91 at A16. OE50 Scores below 0.20 indicate extremely impaired habitat, 0.20 to 0.51 indicate severely impaired habitat (Band C), those from 0.52 to 0.83 indicate significantly impaired habitat (Band B) and those from 0.84 to 1.16 indicate habitat equivalent to reference condition (Band A). These results indicated that on all but one occasion (NCR2 in Spring 2012) the macroinvertebrate assemblages sampled were less diverse than predicted (i.e. OE50 Taxa Score < 1.00). OE50 Taxa Scores at control sites NCR1 and NCR3 in Spring 2020 were the lowest recorded during the EMP.

The SIGNAL2 Indices (Figure 7) recorded during Spring 2020 at NCR1 ranged from 3.1 to 4.2, 3.6 to 4.9 at NCR2, 2.9 to 4.5 at NCR3 and 3.6 to 5.0 at A16. These are indicative of severe to mild water pollution and suggest that Wangcol Creek and the Coxs River at these sites experience some degree of environmental stress due to poor water quality. There were no obvious trends in SIGNAL2 data across the EMP.

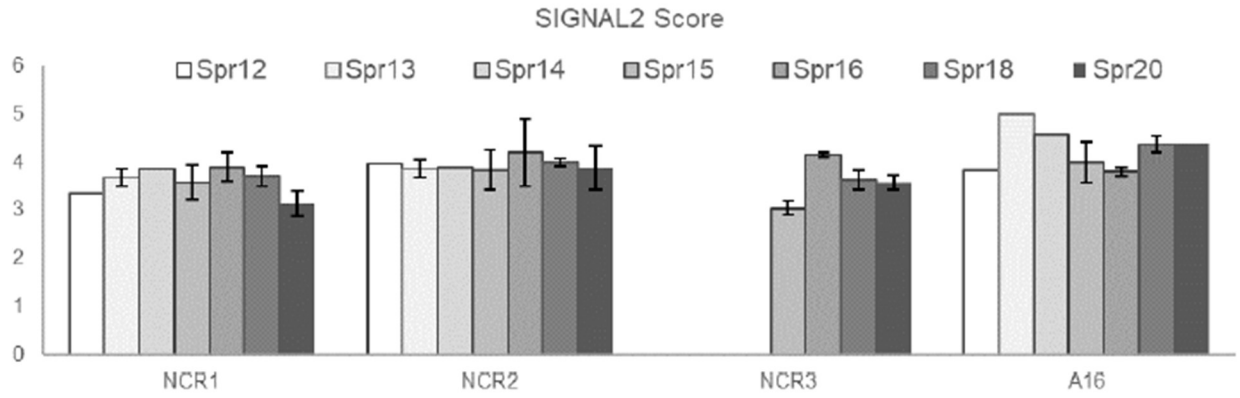

Figure 7 Signal2 results for impact and control sites for the period of 2012-2020

The complex interaction that exists between the various types of disturbances (e.g. those to habitat, water quality and flow) experienced in Wangcol Creek make any changes in water quality, and thus associated changes in macroinvertebrates, difficult to distinguish from those that could be due to the Project. Nevertheless, the EMP adds value to the wider monitoring program, and it is expected that any large magnitude and / or cumulative impacts to aquatic biota would be detected, allowing appropriate management actions to be implemented. Recent changes to the monitoring of aquatic ecology, including the addition of two further macroinvertebrate control sites, will assist in identifying any potential future impacts and help inform remediation efforts as necessary.

6.4.3 Reportable Incidents

No reportable incidents have been recorded against ecological monitoring for the reporting period.

6.4.4 Further Improvements

- Further monitoring should be undertaken as planned. This will maximise the validity of comparisons among data collected following Project commencement and between these data and baseline data. Data from ongoing surveys will allow more confident conclusions to be made on the presence and duration of any potential impact in Wangcol Creek that could be attributed to the Project.
- Three replicate AUSRIVAS samples should continue to be collected from each site during all future surveys. This will provide a measure of the variation present in each indicator at each site, thereby, improving the ability to detect any future impact by enabling the use of appropriate statistical analysis.

6.5 Air Quality Monitoring

6.5.1 Environmental Management

The Repository Management Plan (Lend Lease, 2015a) for the LNAR operations contains an Implementation Strategy in accordance with the Air Quality Monitoring Program, as required under the CoA (CoA D3 (d) and E18) as stipulated by PA 09_0186 and as outlined in the OEMP. The strategy includes specific site management pertaining to the transport and emplacement of ash, managing dust within the ash repository using an extensive sprinkler system and water cart applications, meteorological monitoring and continuous monitoring for dust/airborne particulates. Sprinklers and compaction are used to minimise fugitive dust from the LNAR. Water trucks are used to manage fugitive dust from the haul roads.

Dust management at the LNAR is included in the responsibilities of all activities, including:

- Daily monitoring from weather station.
- Fly ash conditioning.
- Mobile sprinkler system
- Use of perimeter sprays at the ash placement area
- Wash-down of security roadways, haul road/s and vehicle access roads – water carts
- Static dust monitors
- Ash placement operations
- Final and temporary capping of ash; and
- General maintenance of the ash placement area (Lend Lease, 2012)

6.5.1.1 Sprinklers and Pumps

Dust suppression is a key performance objective for ash placement activities. Dust suppression concerns all aspects of exposed ash and ancillary aspects of vehicular traffic during permanent capping and other activities. The main dust suppression method on exposed ash is the use of sprinklers with water sourced from wash down ponds and the blow down towers from Mount Piper's cooling water system – no clean water is used in this application. Water application (measured in sprinkler hours) is based on wind velocity, humidity and temperature. Sprinklers are also used for haul roads. Water source, volumes and sprinkler numbers are monitored daily by Lend Lease and reported to EA NSW monthly.

The Repository Management Plan (Lend Lease, 2015a) provides a guide for sprinkler hours at an optimum of 4 hours per day during low evaporation at less than 3 mm per day to ensure that a target of 5 mm by irrigation application is not exceeded Table 13.

Table 13 Water use guideline

Water use guidelines based on temperature and wind speed	Water use guidelines
>25° >20km/hr (10hrs/day)	15° <20km/hr (<4 hours/day)
15-24° <20km/hr (8 hrs/day)	
15° <20km/hr (4 hours/day)	
Evaporation 3 – 7 mm per day	**Evaporation < 3 mm per day**
Oct, Nov, Dec, Jan, Feb, Mar	April, May, June, July, Aug, Sept

Operation of sprinklers in extreme hot and dry conditions requires extended irrigation hours

6.5.1.2 Air quality monitoring

Air quality impacts at LNAR are managed pursuant to PA 09_0186 and the approved Air Quality Management Plan (AQMP). The AQMP provides the assessment criteria for the LNAR which are monitored through a network of dust monitors.

The monitoring network consists of

- 5 dust deposition gauges (Figure 3), including Dust Gauges 19, 20, 21, 22 and 23
- 1 Tapered Element Oscillating Microbalance (TEOM) measuring <10 µm (PM_{10}) as shown on Figure 3.
- Air Quality Monitoring Station (AQMS) located at Blackmans Flat.

Dust monitoring results are recorded monthly with colour and textural observations.

Performance indicators recommended in the OEMP for air quality monitoring are as follows:

- Increase in Total Suspended Particulates (TSP) by > 2g/m^2/month to a maximum of 3.5g/m^2/month at dust deposition gauges outside the ash placement area
- PM_{10} annual average is <30µg/ m^3 and 24 hour maximum does not exceed 50µg/m^3

The installed dust gauges meet the requirements for the methods for sampling and analysis of ambient air (AS/NZS 3580.10.1:2003).

6.5.2 Environmental Performance

6.5.2.1 Dust suppression – Lamberts North Sprinkler system

Figure 8 reflects a relationship between sprinkler application and evaporation to identify that the target or maximum application rates for irrigation at 5 mm / day was achieved. Net irrigation was calculated by subtracting the daily evaporation from the daily sprinkler irrigation rate.

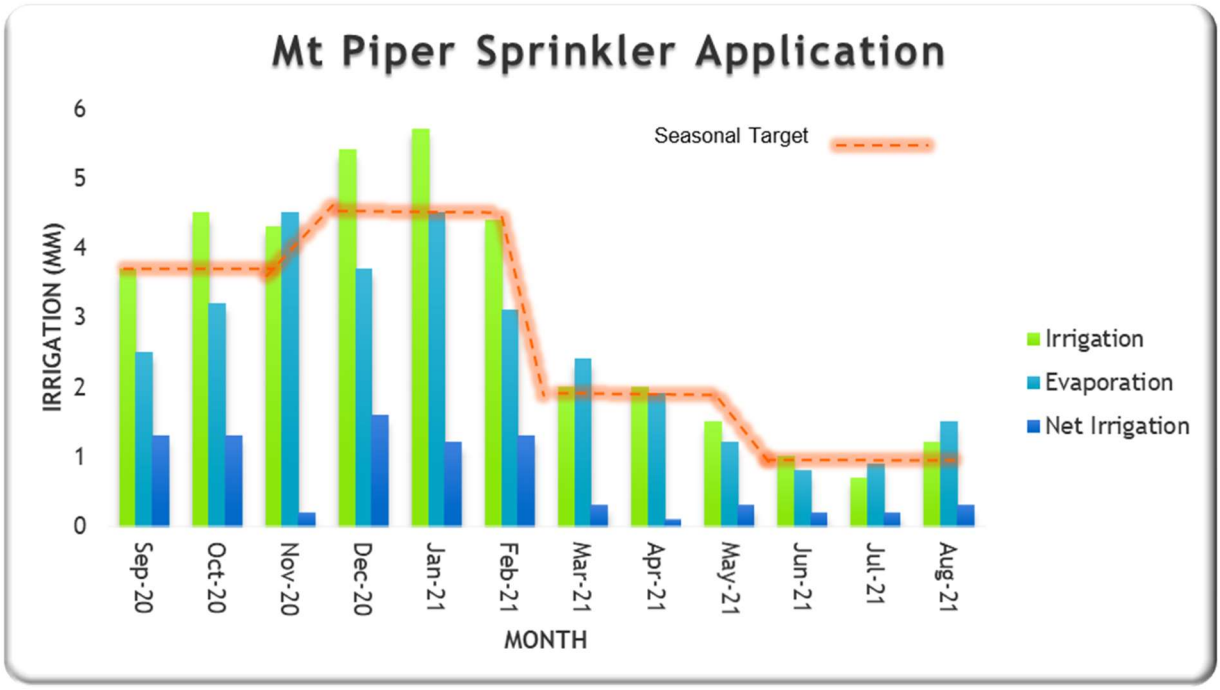

Figure 8 Efficacy of irrigation operations September 2020 – August 2021

6.5.2.2 Air quality monitoring

The 2020/21 reporting period was predominantly characterised by cool and wet climatic conditions, after three exceptionally warm and dry years. Nationally averaged rainfall was 10% above average with a weak La Niña influencing Australia's climate contributing to the third-wettest December on record (BOM, 2021a). However, NSW experienced the driest November since 2002, after a heat trough combined with two frontal systems brought hot and windy conditions to most of the state (BOM, 2021b).

Dust activity across the state was greatly varied throughout the reporting period. The Office of Environment & Heritage's DustWatch Reports (OEH, 2021) reported increased dust activity mainly occurred in the southern parts of NSW throughout the year, with Broken Hill experiencing a dust storm in mid-January 2021. However, rainfall in Central NSW suppressed dust activity in December 2020, and substantial increases in groundcover expected to have led to a drop in overall dust activity in May & June 2021 (OEH, 2021).

Climatic conditions, state-wide dust activity and localised bushfires can influence air quality near the LNAR as reflected in previous AEMRs. These extreme events can impact on air quality in the Lithgow Local Government Area and are not related to impacts or activities at the LNAR.

Dust depositional results across gauges DG19-DG23 from September 2020 to August 2021 are shown in Table 14. The results for all gauges across the reported months, except for DG21 in July 2021, were below the assessment criteria of 3.5 g/m^2. The depositional dust results across all gauges significantly reduced from September 2020 to October 2020. The October 2020 DustWatch Reports released by OEH however noted an increase in dust activity, despite a drop in wind strength and good rainfall across most of NSW.

The depositional dust results across all gauges, except for DG20, increased in November 2020. The November 2020 OEH DustWatch Report attributes the increase in dust activity to average to below average rainfall and decreased groundcover. Depositional dust results from December 2020 to July 2021 generally stayed stable or showed a decreasing trend. Dust gauge DG21 had an anomalously increasing trend between April 2021 to July 2021, when it exceeded the assessment criteria, before decreasing again in August 2021.

Comparative annual average depositional dust data for the combined average over the previous six-year period is presented in Table 14. The increase in annual average for depositional dust concentrations from September 2017 through to January 2020 (refer to Table 14) is generally reflective of the extended drought conditions, increased frequency in state-wide dust storms and bush fires impacting the local air shed in the vicinity of the LNAR. The

recorded decrease in annual average depositional dust for all gauges in the 2021 reporting period, i.e. 1 September 2020 to 31 August 2021, can be attributed to the generally wetter reporting period breaking the extended drought conditions experienced in previous years.

Table 14 Annual depositional dust summaries

Date	Total Insoluble solids (g/m2/month)				
	DG 19	DG 20	DG 21	DG 22	DG 23
	Insol.	Insol.	Insol.	Insol.	Insol.
Sep-20	1.41	1.05	1.57	0.85	1.03
Oct-20	0.58	0.5	0.51	0.54	0.81
Nov-20	1.03	0.27	1.55	2.05	2.4
Dec-20	0.55	0.48	0.88	1.09	2.1
Jan-21	0.65	0.56	0.94	0.59	0.38
Feb-21	0.33	0.23	0.65	1.41	1.87
Mar-21	0.44	NS	0.53	0.53	1.55
Apr-21	0.51	0.11	0.22	0.89	0.43
May-21	0.63	0.49	0.89	0.77	0.77
Jun-21	0.19	0.36	1.53	0.6	0.55
Jul-21	0.12	0.14	4.08	0.27	0.27
Aug-21	0.76	0.48	1.47	0.42	0.74
Annual averages					
2021	0.6	0.4	1.2	0.8	1.1
2020	1.8	1.8	2.1	1.1	2.3
2019	1.7	1.8	2.4	2.2	2.7
2018	0.9	1.4	1.4	1.1	1.0
2017	0.4	0.7	1.1	1.4	1.0
2016	0.6	0.7	1.5	0.6	0.7
2015	1.1	0.8	1.4	0.8	0.8

Comparative depositional dust data for each of the five OEMP dust deposition gauges are presented in Figure 9-Figure 13. The generally higher annual average for depositional dust concentrations from September 2018 through to January 2020 (refer to Figure 9 to Figure 13) is generally reflective of the extended drought conditions, increased frequency in state-wide dust storms and bush fires impacting the local air shed in the vicinity of the LNAR within that period. There was a sudden increase in insoluble solids experienced in January 2020 which was recorded in four of the five monitoring gauges (refer Figure 9 to Figure 13). This is understood to be attributed to elevated levels of dust particles from dust storms and bushfires settling in the gauges and was not attributed to activities at the LNAR. Depositional dust concentrations post-January 2020 have decreased for all gauges, with a single anomalous peak above the 3.5 µg/m^2 per month limit recorded in gauge DG21 in July 2021 (Figure 11).

The anomalously high result recorded in Dust gauge DG21 in July 2021 (Figure 11) is deemed not to be caused by operations at Lamberts North. The wind in July 2021 was blowing from a predominantly West-South-West direction according to the meteorological data received from Mt Piper Weather Station. The LNAR is situated to the East-South-East of DG21. It is therefore highly likely that the depositional dust recorded within the DG21 was from other external sources.

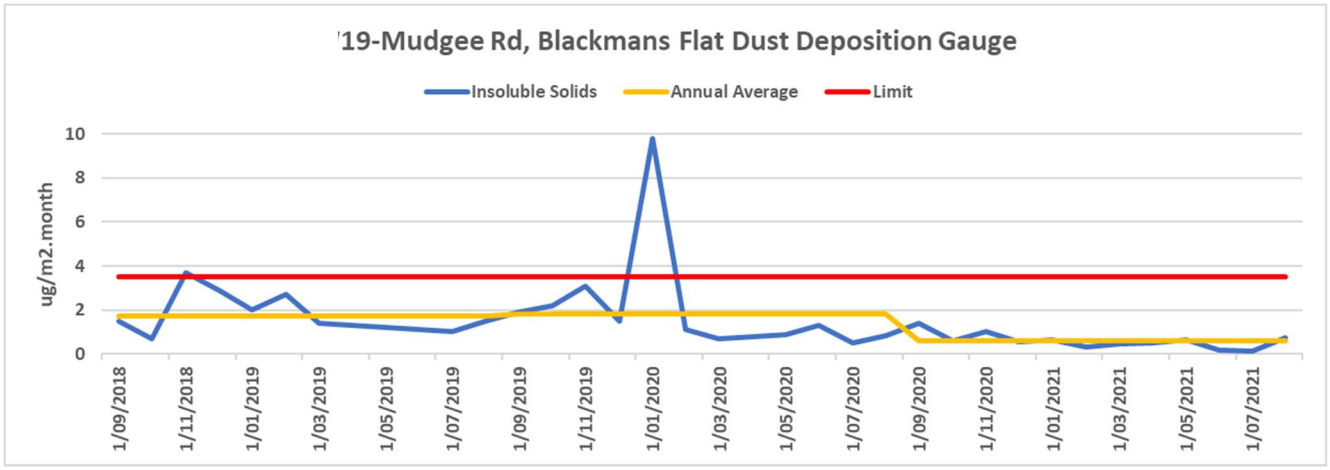

Figure 9 Depositional Dust Summary for Dust Gauge 19

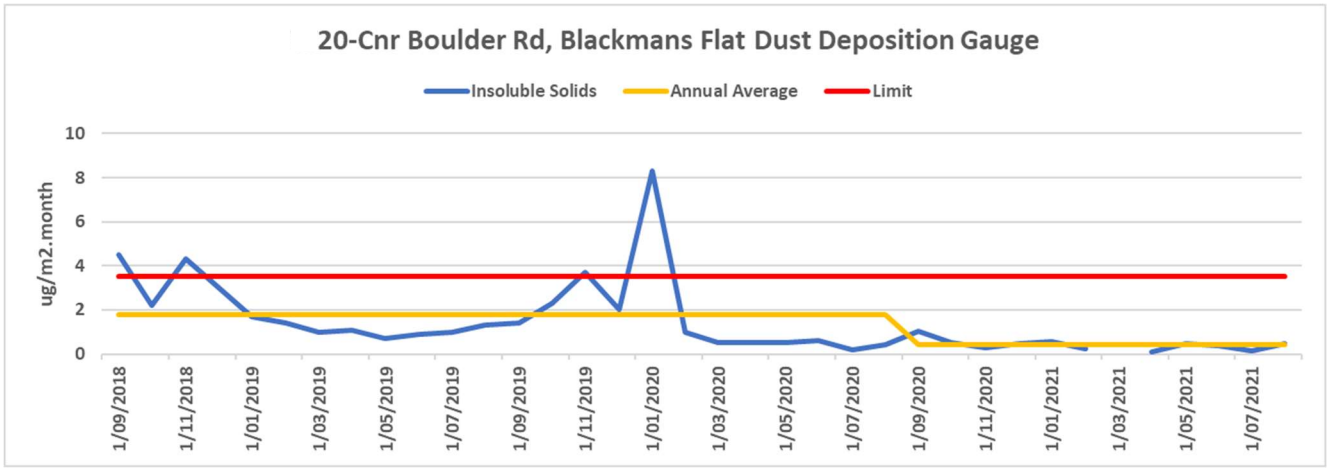

Figure 10 Depositional Dust Summary for Dust Gauge 20

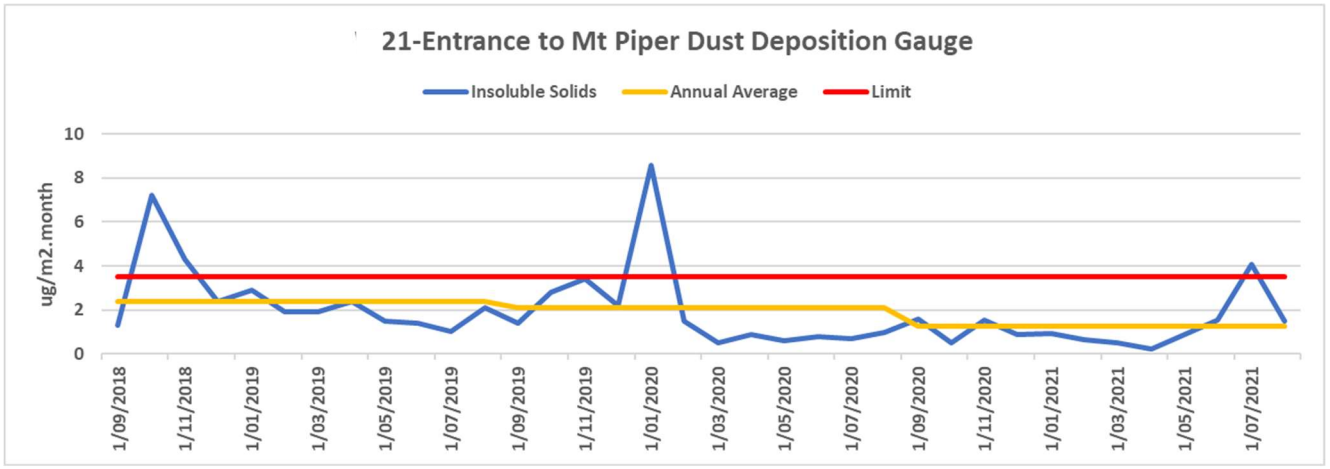

Figure 11 Depositional Dust Summary for Dust Gauge 21

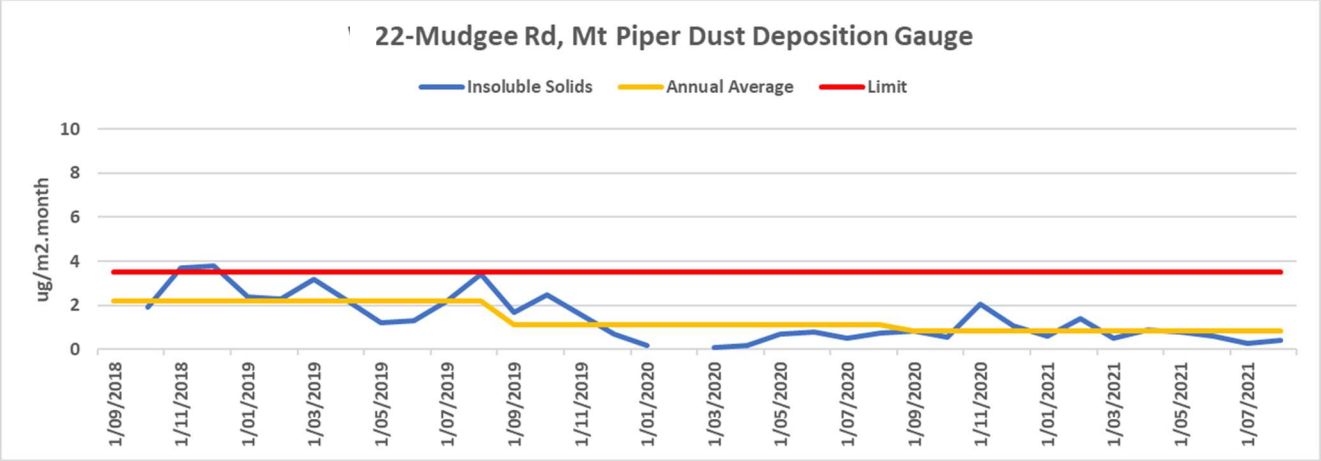

Figure 12 Depositional Dust Summary for Dust Gauge 22

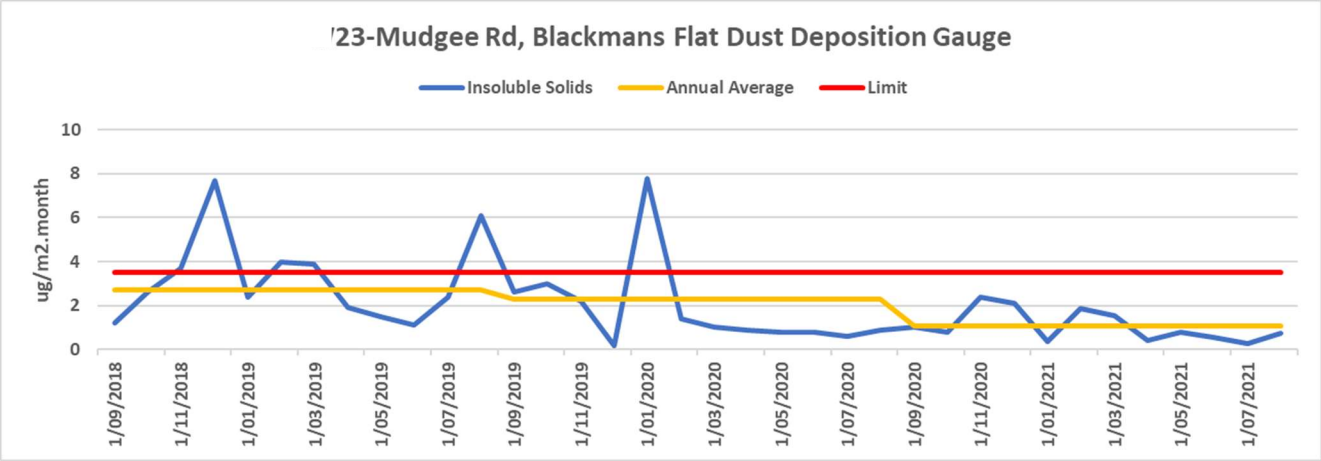

Figure 13 Depositional Dust Summary for Dust Gauge 23

EA NSW monitors fine particulates at LNAR, Blackmans Flat and Wallerawang air quality stations. These are located to the northwest, east and southern directions from the LNAR. Analysis of continuous air quality (PM_{10}) monitoring data from the Blackmans Flat, Wallerawang and LN air quality stations was undertaken for the reporting period (Figure 14).

The results show a generally decreasing trend of fine particulate matter over the reporting period, with all results below the National Environment Protection Measures (NEPM) Daily Standard Limit for PM_{10} (Figure 14). Above average rainfall has likely attributed to the fine particulate concentration levels remaining at the typically background levels for the region throughout the reporting period. With the rainfall received in the 2020-21 reporting period, the annual average PM_{10} results for LNAR is 6.7 µg/m^3, which is below the annual average criteria of 30 µg/m^3. The other local monitoring sites recorded PM_{10} results of 6.4 µg/m^3 at Blackmans Flat and 14.5 µg/m^3 at Wallerawang. The analysis indicates that the PM_{10} concentrations recorded during the 2020-21 reporting period are likely attributed to sources other than the LNAR. Furthermore, the dust suppression systems were operating and functional at LNAR.

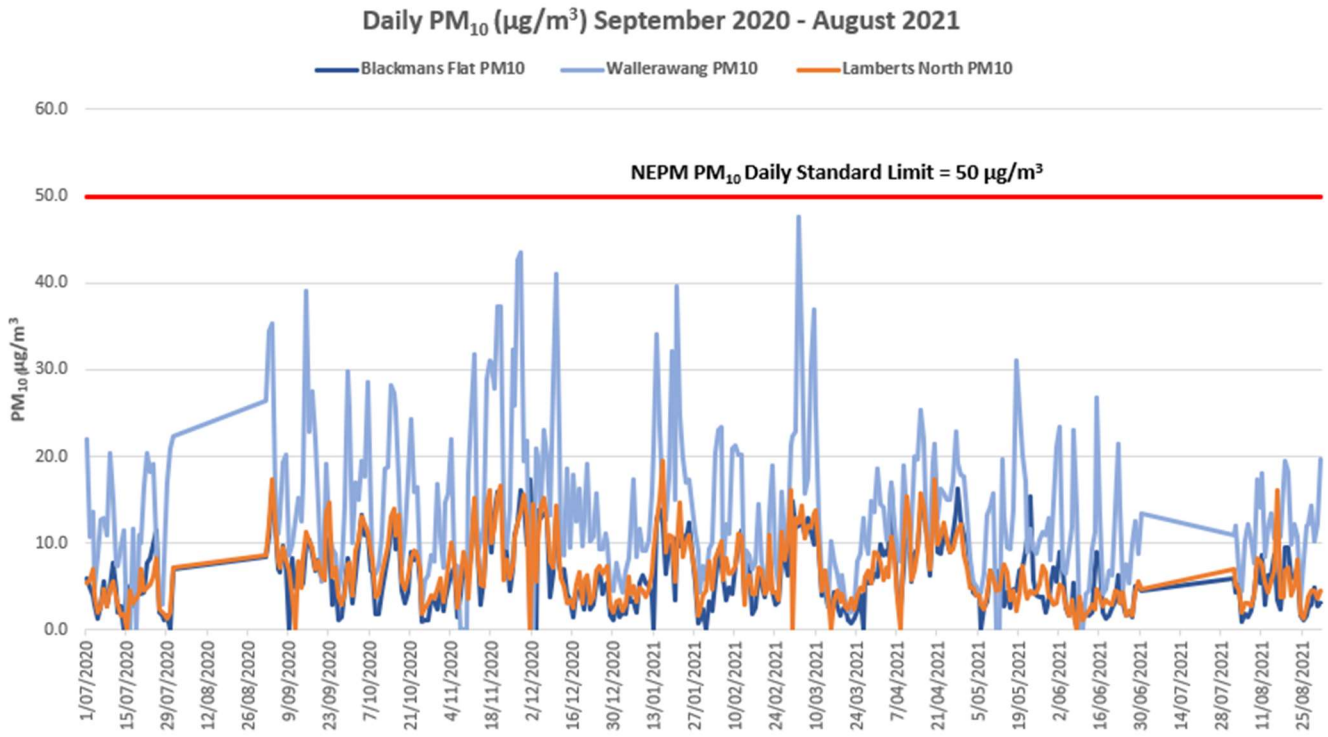

Figure 14 Average PM_{10} from the Mt Piper TEOM from September 2020 to August 2021

6.5.3 Reportable Incidents

No reportable incidents have been recorded against air quality management for the reporting period.

6.5.4 Further Improvements

The air quality management controls have been effective and will continue to be implemented for the LNAR, as such no further improvements have been identified for the next reporting period.

6.6 Waste Management

6.6.1 Environmental Management

Waste disposal practices at the LNAR are managed in accordance with Environmental Protection Licence 13007 and the Waste Management Sub-Plan (WMP, OEMP Section 6.8). Waste materials are assessed, classified, managed and disposed of in accordance with *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes* (EPA, 2014). The WMP addresses waste management on site, and satisfies CoA D2 (g), E23, E24 and E25.

The WMP provides a framework for EA NSW, its contractors and vendors to manage waste and to minimise the potential for adverse impacts to sensitive receivers during the operation of the Project and is comprised of the following targets:

- To ensure waste at the LNAR is managed in accordance with the conditions of EPL 13007.
- To ensure that all Staff and associated contractors involved in the LNAR operations are made aware of the waste management measures contained in the WMP, that waste generated on LNAR is recycled or disposed of in accordance with the WMP.

EA NSW and associated contractors:

- Are not to cause, permit or allow any waste generated outside the ash repository to be received at the ash repository for storage, treatment, processing, reprocessing or disposal, including no wastes except as permitted by the licence or an exemption certificate.
- Waste generated by site personnel (including maintenance wastes such as oils and greases) are collected on a regular basis to be recycled or disposed of at an appropriate facility.
- Evidence of a recycling system in use and site-generated waste being disposed of to an appropriate facility.
- Waste management details are recorded in the monthly environmental report.

Waste-related documents and records reflect adherence to these protocols, thereby providing the foundations for a transparent approach to waste management. The WMP provides further guidance and detail on specific waste streams and applicable management measures (OEMP Section 6.8).

6.6.2 Environmental Performance

The activities at the LNAR were deemed to have met the WMP targets for waste management for the 2020-2021 reporting year. There were no non-conformances identified and the WMP requirements were found to be compliant.

6.6.3 Reportable Incidents

No reportable incidents have been recorded against waste management for the reporting period.

6.6.4 Further Improvements

No further improvements are planned for the next reporting year.

6.7 Heritage Management (Aboriginal & non-Aboriginal)

6.7.1 Environmental Management

Project Approval 09_186 contains CoA's concerning heritage management in Part B – Prior to Construction (B5 (f)) and Part C – During Construction (C8 – 9). These conditions are managed under Section 5.6 of the CEMP. The LNAR has progressed into the operational phase and CoA Part B and C no longer apply.

Whilst there are no specific CoAs for Project Approval 09_0186 for Part E – During Operations, regarding heritage management, contract personnel are educated on their due diligence duties in respect of the protection of Aboriginal and non-indigenous heritage sites and items.

6.7.2 Environmental Performance

No additional sites have been recorded within the vicinity of the LNAR.

6.7.3 Reportable Incidents

No reportable incidents have been recorded against heritage management for the reporting period.

6.7.4 Further Improvements

No further improvements have been identified for the next reporting period.

7. Water management

7.1 Surface Water Quality Monitoring.

7.1.1 Environmental Management

The Soil and Surface Water Management Plan (SSWMP) is a sub-plan as outlined in the OEMP and addresses the specific requirements of the CoA D3 (c) and E16. The SSWMP addresses soil and water cycle management on site, including a surface water monitoring program at receiving waters that is comprised of the following targets:

- The water quality at Wangcol Creek is not impacted by LNAR operations;
- Zero environmental incidents that relate to pollution of waters at Wangcol Creek.
- Erosion to be effectively managed on site and not have an influence and/or impact on surrounding lands outside the boundary of LNAR.

Performance criteria:

- The Environmental Goals adopted have taken into consideration local baseline surface water conditions in Wangcol Creek prior to the commencement of ash placement in the eastern side of the MPAR (referred to as pre-placement). Baseline conditions were specifically established based on the 90th percentiles of the water quality dataset from monitoring site WX22 in Wangcol Creek. An early warning is triggered when the post-ash placement 50th percentiles for the various water quality indicators at each of the surface water monitoring sites, exceed the pre-placement 90th percentiles (Aurecon 2017).
- Ecological results at Wangcol Creek will indicate no significant variation from historical baseline data.
- No visual evidence of erosion and sedimentation impacts on Wangcol Creek following significant rainfall events.

Runoff water from the LNAR is contained in clean and dirty water sediment ponds and forms the primary source of water for dust suppression on exposed ash and capped areas as well as irrigation of the revegetated areas. The CoAs stipulate that a monitoring program must be implemented to record and observe water quality and potential impacts from repository operations on regional surface waters. The OEMP for the LNAR requires sampling at three locations (Figure 3; Table 15).

Table 15 Location of Surface Water Monitoring Points

Site ID	Location Description	Monitoring Frequency
LMP01	Final Holding Pond Weir – monitoring point is located north-west of the MPAR. This monitoring site is located in an upstream position relative to the LNAR.	Monthly[1]/Quarterly[2]
NC01	Located in Wangcol Creek. This monitoring site is located upstream to the LNAR and to the north of the MPAR and is an aquatic life background site.	Monthly[1]/Quarterly[2]
WX22	Located in Wangcol Creek at a stream gauge to the east/down-stream of the MPAR and LNAR and monitoring site LDP01. This monitoring site is also situated down-stream of monitoring bore D8.	Monthly[1]/Quarterly[2]
1. Selected field parameters monitored on a monthly basis as required 2. Monitoring undertaken by analytical laboratory Nalco Water – Ecolab		

Changes in the water quality and trace metals at Wangcol Creek receiving water site (WX22), from pre-ash placement (October 2012 to August 2013) to the post-ash placement period (September 2013 to August 2017) was examined in the past by Aurecon reported within their Water Quality Monitoring Reports. For the reporting period 2020-2021 Environmental Resources Management Australia (ERM) was commissioned by EA NSW to carry out the Water Quality Monitoring Report (WQMR), refer to Appendix G.

7.1.2 Environmental Performance

ERM was commissioned to assess the results from the surface water monitoring program as set out in the OEMP and as required by Project Approval 09_0186 during the reporting period. A copy of the WQMR is contained in Appendix G. The surface water monitoring carried out monitors for changes in water quality in Wangcol Creek caused by multiple land uses in the area and is not restricted to LNAR activities.

Results above the LNAR water quality goals were recorded during the reporting period with respect to surface water. These results are most likely due to activities associated with the MPAR and this has triggered contingency measures requiring the commencement of in independent investigation. This investigation is currently under way. Concentrations for the last 12 months, including those above the Environmental Goals, are presented in the tabulated surface water results in the annual water quality monitoring report in Appendix G.

Review of the surface water data presented in Appendix DG indicates that, for specific analytes, concentrations at the downstream monitoring location of WX22 were generally higher than those reported at upstream locations LMP01 and NC01. Concentrations of EC, TDS, chloride, sulfate and nickel in surface water from WX22 were generally higher than in samples from the upstream monitoring locations. However, these results are not considered to be due to ash placement activities occurring at the LNAR. As reported in the Annual Environmental Monitoring Report – Water Management and Monitoring for the Mt Piper Power Station Brine Conditioned Fly Ash Co-Placement Project (ERM, 2020) which focusses on the MPAR, the results are considered to be related to BCA placement activities at the MPAR (refer to Appendix G for further details).

Higher concentrations for a range of analytes at WX22 including TDS, EC, chloride, sulfate, filtered boron, copper and nickel were reported in the sample collected during the December 2020 sampling event. However, the concentrations reported were an order of magnitude lower than previously reported highs in the summer period. Higher summer rainfall during this reporting period has likely resulted in less relative groundwater contributing to the surface water receiving environment.

Elevated concentrations of copper, barium, boron and iron in surface water from Wangcol Creek (WX22) during the 2020/21 reporting period are considered to be comparable to background surface water quality in the area, based on the surface water results from LMP01 and NC01 which are located upstream of the Ash Repositories.

A review of concentration trends in surface water with respect to key indicators including chloride (Figure 15), nickel (Figure 16), sulfate (Figure 17) and TDS (Figure 18) is presented below. These indicators were selected based on the results being above the Environmental Goals for surface water, the potential increase in concentration observed downstream of the Ash Repositories and/or trend analysis presented in previous annual monitoring reports. Surface water trend graphs for the period 2010 to the end of the current reporting period are presented below. Additional graphs generated and reviewed as part of the trend analysis are presented in Appendix DG.

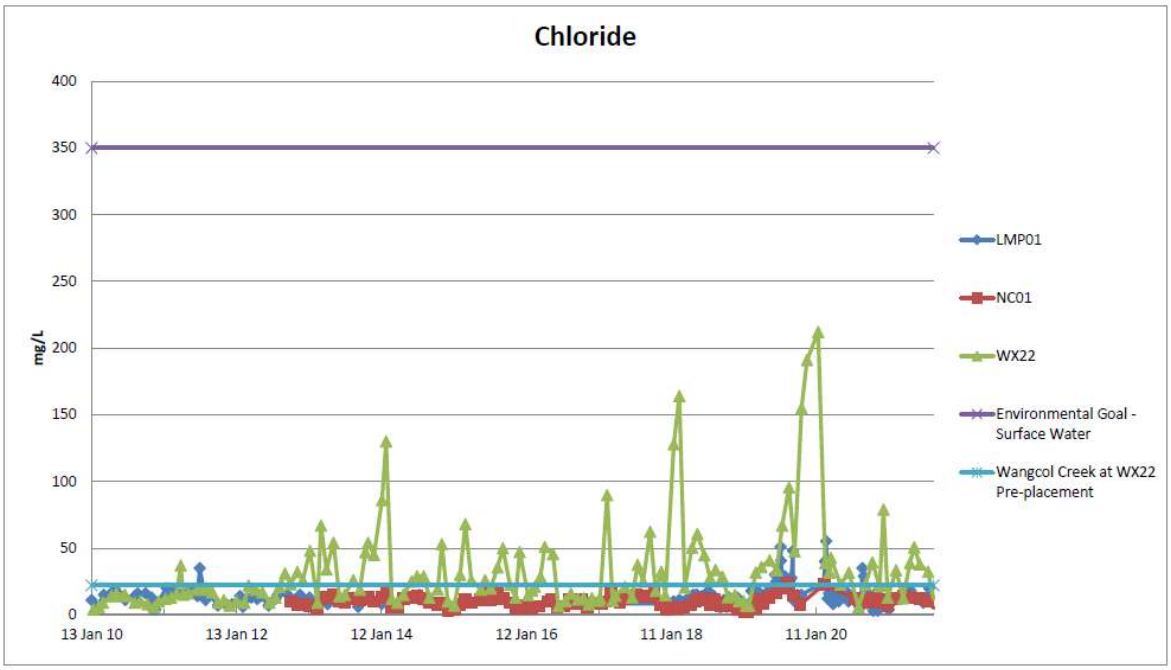

Figure 15 Chloride Concentrations in Surface Water

Chloride concentrations for all surface water monitoring locations were consistently below the Environmental Goal of 350 mg/L throughout the period 2010-2020. The pattern of chloride concentrations in surface water from WX22 during the 2020/21 reporting period appeared to be comparable with previous years, with the highest concentrations reported during the summer months. The higher concentrations are likely associated with lower stream flows, and increased influence of groundwater seepage during the summer months.

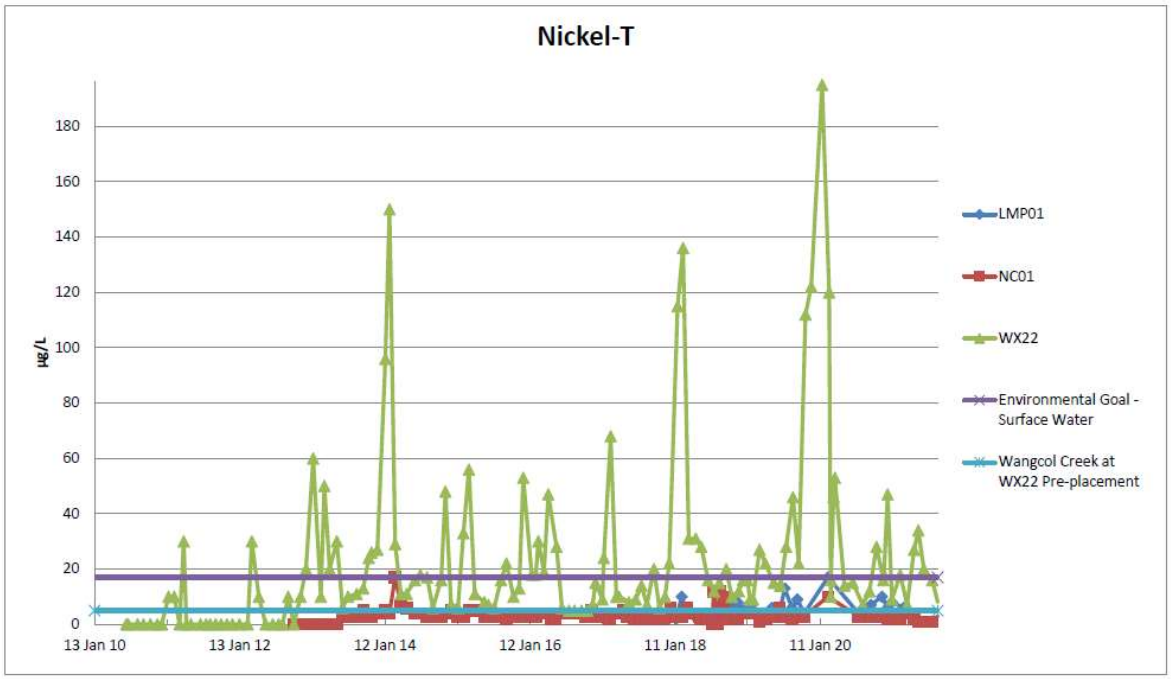

Figure 16 Nickel Concentrations in Surface Water

Nickel concentrations at LMP01 and NC01 have been generally stable since monitoring commenced in 2012. These upstream monitoring locations have reported concentrations of nickel equal to the Environmental Goal for surface

water in March 2014 (NC01 – 17 µg/L) and February 2020 (LMP01 - 17 µg/L); other concentrations at these locations were below the Environmental Goal. No concentration trend is apparent in the data.

A maximum nickel concentration of 195 µg/L was reported in surface water at WX22 in January 2020 (outside of this reporting period). The highest nickel concentrations reported during this reporting period were lower than previous maximums. The maximum nickel concentration of 47 µg/L (reported in December 2020) was above the Environmental Goal. Similar to chloride, the highest nickel concentrations at WX22 typically occurred during the summer, likely associated with periods of lower surface water flows. Nickel concentrations in surface water from WX22 was above the pre-placement trigger level on numerous occasions during the 12 months of the current reporting period.

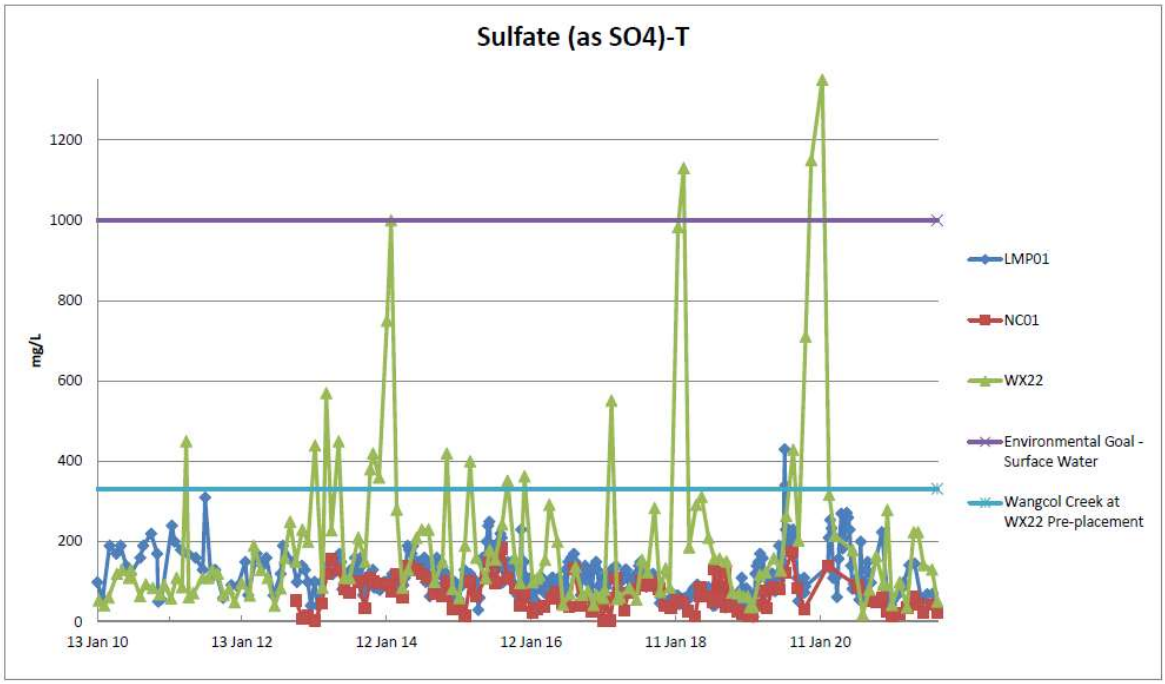

Figure 177 Sulfate Concentrations in Surface Water

Sulfate concentrations at LMP01 and NC01 have remained relatively stable since 2010, consistently below the Environmental Goal for surface water. The sulfate concentrations at WX22, downstream of the LNAR, were generally stable between 2010 and 2012. Post 2012, sulfate concentrations at WX22 were equal to or above the Environmental Goal during the summer period in February 2014, February 2018, November 2019 and January 2020.

During this reporting period, the peak concentration was reported during the summer months (279 mg/L reported in December 2020), noting that concentrations remained below the Environmental Goal, and were also lower than the summer peaks recorded in previous reporting periods.

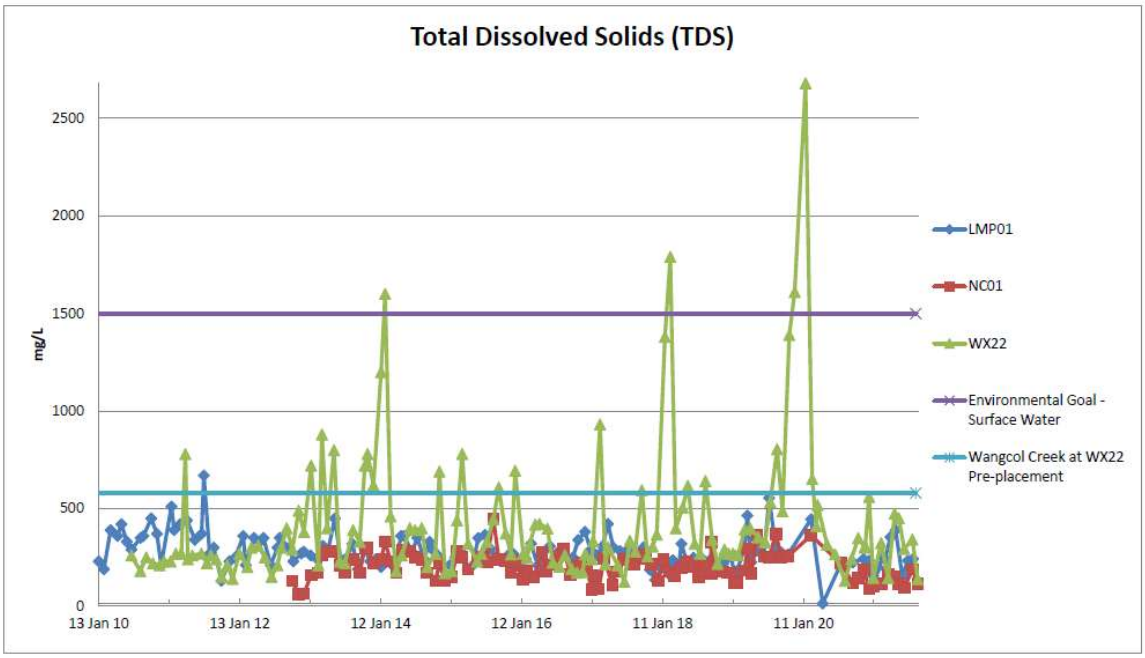

Figure 188 TDS Concentrations in Surface Water

TDS concentrations in surface water at LMP01 and NC01 have remained relatively stable since 2010, consistently below the Environmental Goal. At WX22, downstream of the LNAR, the TDS concentrations were generally stable between 2010 and 2012. Post 2012, the TDS concentrations at WX22 have reported above the Environmental Goal during the summer period in February 2014, February 2018, November 2019 and January 2020, consistent with the sulfate concentrations.

During this reporting period, TDS concentrations at WX22 were consistently below the Environmental Goal, and were lower than the summer peaks recorded in previous reporting periods.

7.1.3 Reportable Incidents

No reportable incidents have been recorded against surface water management for the reporting period.

7.1.4 Further Improvements

Surface water will continue to be monitored and appropriate action taken to mitigate potential impacts to Wangcol Creek. Mitigation controls will be informed following the completion of the independent groundwater investigation.

7.2 Groundwater Monitoring

7.2.1 Environmental Management

The Groundwater Management and Monitoring Plan (GMMP) is a sub-plan of the OEMP and seeks to address the specific requirements of the CoA D3 (b), E15 and E17. The objective of the GWMP is to assess compliance with the CoAs. The GMMP provides for the requirements for the ongoing groundwater monitoring program in accordance with CoA E15. The GMMP was established and implemented in October 2012 prior to construction activities and in addition to the existing monitoring regime for MPAR. The locations of the groundwater monitoring sites are presented in Figure 3.

In terms of performance criteria, water quality trigger values set out in the OEMP (CDM Smith 2013), as modified by Aurecon (2017), have been adopted as Environmental Goals for the analytes. In addition to the Environmental Goals outlined above, an early warning is triggered when the post-ash placement 50th percentiles for the various water quality indicators, exceed the pre-ash placement 90th percentiles (Aurecon 2017) (for further details, see Appendix G).

The GMMP provides the procedures and protocols that apply to the monitoring and testing of water quality and involves quarterly sampling of existing long-term bores associated with MPAR and new bores located south of Huon Gully. A list of the groundwater monitoring locations is provided below:

- Bore D9: East of Huon Gully and south of Wangcol Creek, located outside the ash placement area. Used to monitor groundwater quality and potential influence on Wangcol Creek
- Bore D8: North of Wangcol Creek. Used to monitor groundwater quality and potential influence on Wangcol Creek
- Bore D10 & D11: The MPAR bores, on the western side of the ash placement area are used to monitor inflows from MPAR to the LNAR in Huon Gully.
- Bore D1: North of Huon Gully, used to detect seepage from the north-eastern MPAR where BCA is emplaced and monitor groundwater quality and potential influence on Wangcol Creek.
- Bore D15: Inside of LNAR approval area, south and cross-hydraulic gradient of the currently active LNAR ash placement area and south of multipurpose storage ponds Pond BWA – Pond BWC
- Bores D16 & D17: Inside of LNAR approval area, south and cross-hydraulic gradient of the currently active LNAR ash placement area and north of the Centennial Coal reject emplacement areas
- Bore D18: Inside of LNAR approval area, south and cross-hydraulic gradient of the currently active LNAR ash placement area
- Bore D19: Downgradient of LNAR approval area, adjacent to Centennial's DML Dam

Bores D10 and D11 are considered to be **upgradient of the LNAR** with the results used to indicate groundwater contributions from the MPAR. Exceedances of the Environmental Goals for these bores are considered to be unrelated to either background groundwater conditions in the region or to potential impacts resulting from activities at the LNAR. These groundwater conditions are currently subject to review and management as part of the independent groundwater investigation.

Bores D15, D16 and D17 in the southern portion of the LNAR are considered to be **south of and across gradient of the LNAR**, with the results used to indicate baseline groundwater contributions. The Environmental Goal exceedances in this area are considered unlikely to be a result of activities at the LNAR based on the inferred direction of groundwater flow

Bores D1, and D8 and D9, are considered to be **downgradient of the LNAR and the MPAR. E**levated detections of Environmental Goals in these bores are also elevated relative to concentrations in bores to the south/across gradient of the LNAR, and are considered to be reflective of the same groundwater conditions reported at D10 and D11 (i.e. upgradient relative to groundwater flow direction). It is considered that exceedances of Environmental Goals are not a result of activities at LNAR. These groundwater conditions are currently subject to review and management as part of the independent groundwater investigation.

7.2.2 Environmental Performance

ERM was commissioned to assess the results from the groundwater monitoring program required by the OEMP and Project Approval 09_0186 during the reporting period. A copy of the WQMR is contained in Appendix G. The groundwater monitoring carried out during the reporting period identified a number of exceedances of water quality goals contained in the GMMP and this triggered contingency measures requiring the commencement of a groundwater investigation. This investigation is currently under way.

Based on groundwater quality data from bores located up gradient (and between the MPAR and LNAR), these concentrations (particularly chloride) are unlikely to be related solely to the LNAR. Based on these results, EA NSW is undertaking further assessment and an independent investigation of groundwater and surface water in the vicinity of the MPAR and LNAR.

A review of concentration trends with respect to key indicators including chloride (Figure 19), nickel (Figure 20), sulfate (Figure 21) and TDS (Figure 22) is presented for bores D11 (upgradient of the LNAR), D15 (south of the LNAR) and D9 (downgradient of the LNAR and the MPAR).

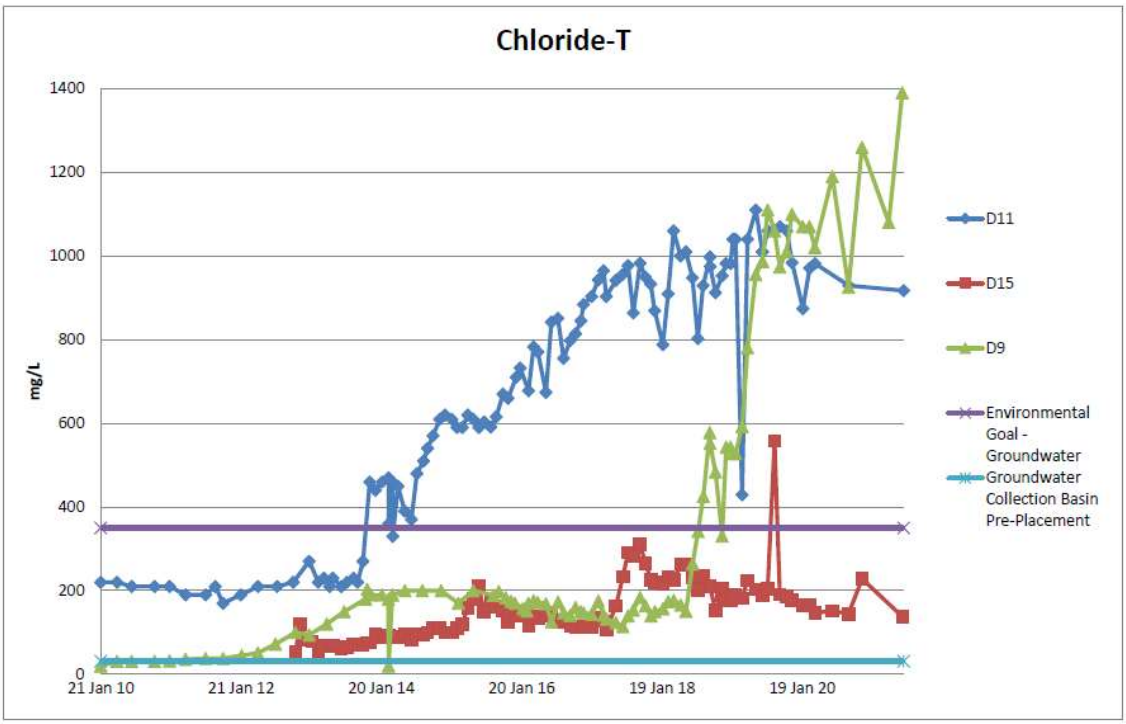

Figure 199 Chloride Concentrations in Groundwater

There is a generally increasing trend in chloride concentrations in groundwater from bore D11, particularly from the end of October 2013, when they increased above the Environmental Goals. Concentrations of chloride in groundwater from this bore appear to have stabilised since 2018 and this has continued during the 2020/21 reporting period.

To the south of the LNAR, chloride concentrations in groundwater from bore D15 increased in 2017, but have subsequently declined. A peak in chloride concentrations at bore D15 occurred in August 2019; however, this peak appears anomalous and is comparable with peaks identified for boron, sulfate, TDS and manganese from the same monitoring event. Since August 2019, the overall trend for chloride at D15 is generally stable and concentrations remained consistent with the historical dataset. With the exception of the August 2019 value, chloride concentrations in groundwater from D15 have remained below the Environmental Goals.

Chloride concentrations in groundwater from bore D9 were generally stable from November 2013 to May 2018. However, since then, chloride concentrations have generally increased, reaching a maximum in June 2021. As such, chloride concentrations in groundwater from this bore continue to show an upward trend and have been above the Environmental Goal for groundwater since December 2018.

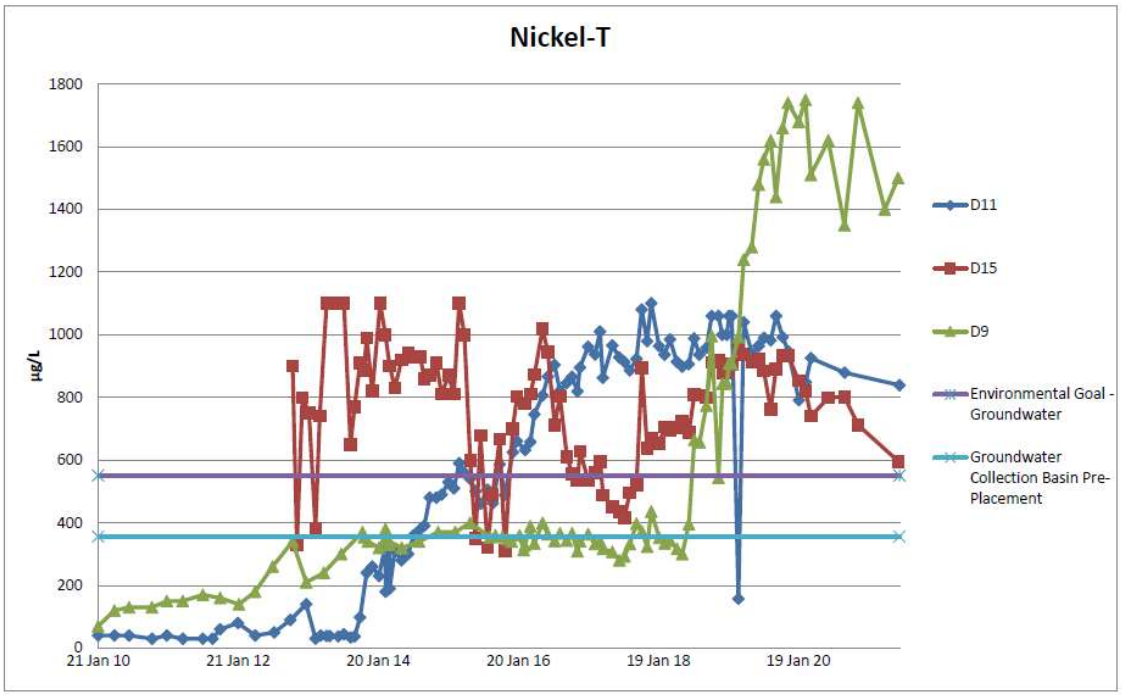

Figure 20 Nickel Concentrations in Surface Water

Nickel concentrations in groundwater from bore D11 increased from late 2012 to the end of 2017. Concentrations have stabilised since 2018.

Nickel concentrations in groundwater from bore D15 have fluctuated above and, at times below, the Environmental Goal since monitoring commenced in 2012. However, since October 2017 nickel concentrations have remained above the Environmental Goal. During the 2020/21 reporting period concentrations remained within historical ranges however a decreasing trend is evident with the lowest concentration recorded in June 2021 since September 2017.

Nickel concentrations in D9 increased from 2010 to the beginning of 2014. Nickel concentrations were generally stable from 2014 to mid-2017, after which concentrations have overall increased and, in the 2020/21 reporting period, remained in the high end of the previously reported concentration range.

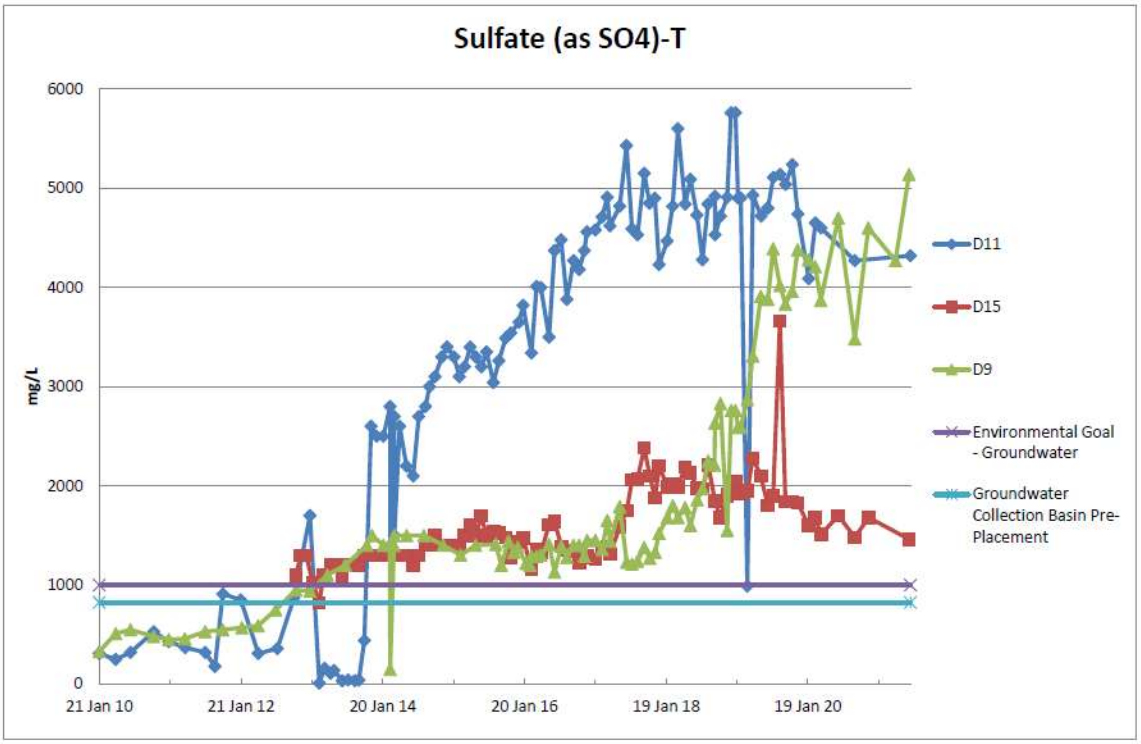

Figure 21 Sulfate Concentrations in Surface Water

An increase in sulfate concentrations was noted in groundwater from D11 in November 2013, with an increasing trend continuing until June 2017. Since then concentrations have fluctuated but have remained relatively stable; however, they continue to exceed Environmental Goals.

An increasing sulfate trend was apparent at bore D15 throughout 2017; however concentrations have stabilised since that time. A peak in sulfate concentrations at bore D15 occurred in August 2019. This peak appears anomalous although it was comparable with peaks identified for boron, chloride, TDS and manganese from the same monitoring event. Since August 2019, the overall trend for sulfate at D15 has been stable or potentially decreasing. However, concentrations have remained consistent with the historical dataset.

Consistent with the EC and TDS trends, sulfate concentration trends have been increasing in bore D9 since July 2018. This trend has continued through the current reporting period with the highest reported concentration recorded in June 2021.

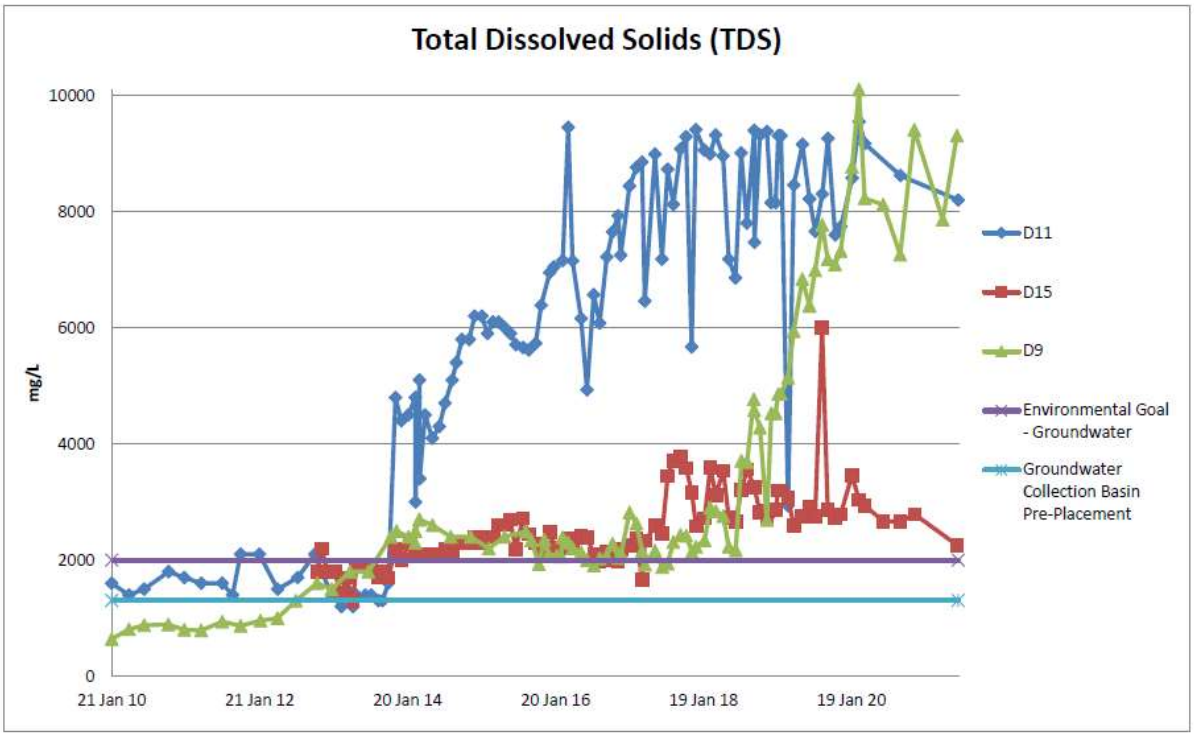

Figure 22 TDS Concentrations in Surface Water

A generally increasing trend in TDS concentrations was noted in groundwater from bore D11 since September 2013. TDS concentrations have generally been more variable, not increasing, in groundwater from D11 since March 2016.

A peak in TDS concentrations at bore D15 occurred in August 2019. This peak appears anomalous although it was comparable with peaks identified for boron, chloride, sulfate and manganese from the same monitoring event. Since August 2019, the overall trend for TDS in groundwater from bore D15 appears to be generally stable, and concentrations have been consistent with the historical dataset.

TDS concentrations in groundwater from D15 and D9 increased slightly until July 2018. Beyond July 2018 concentrations in groundwater from bore D15 have remained stable whereas those in groundwater from bore D9 have increased, reaching the highest reported concentration in February 2020. TDS concentrations at D9 have since fluctuated, but did not exceed the February 2020 peak. TDS concentrations in groundwater from bore D15 began to decline in January 2020, whilst remaining within historical range.

7.2.3 Reportable Incidents

No reportable incidents have been recorded against groundwater managed for the reporting period.

7.2.4 Further Improvements

Triggered by monitoring undertaken for the MPAR, an independent groundwater assessment is currently underway to investigate the variation of chloride concentrations in groundwater. This will assist in determining the source and pathway of elevated chlorides to Bore D10 and other sites near the LNAR.

7.3 Hydrological Monitoring

The hydrological monitoring program, required by CoA E17, was incorporated into the GMMP because of the change in design to LNAR addressed in the Consistency Report (SKM, 2012). It is noted that this particular condition relates to assessing and quantifying the impacts and effectiveness of the transformed section of Huons Creek into a subsurface drainage line. Monitoring was undertaken for a period of five years and is now completed.

7.4 Erosion and Sediment Control

7.4.1 Environmental Management

The LNAR catchment area uses external batters and laybacks to stabilise the ash placement and direct runoff to swale drains that are situated parallel to the batters. The swale directs the water towards a controlled point, being an off-flow structure placed approximately every 100m along the batter. The off-flow structure, which is typically a rock-lined chute, directs the water to a containment pond.

The trucks deliver ash to the working face and create a number of piles next to each other, prior to final placement. The piles of ash allow for any runoff to be directed to the dirty water sediment pond(s). The ash is then graded into its final position and compacted by rollers to specific compaction criteria to mitigate erosion and infiltration.

7.4.2 Environmental Performance

Management of the ash benches is with the primary principle of eliminating uncontrolled runoff over any batter. All benches associated with the LNAR area are graded west to ensure security against a breach from any external boundary. All surface water runoff from the ash footprint of the LNAR is managed within the boundary of the ash placement area.

The location of water retention within the LNAR has remained unchanged since 2014 in that surface water flow is retained over the original drainage line installed on the base of the placement site. All water collected on the LNAR is directed to the west side retention location. Free water is drained through the ash via a furnace bottom ash drainage line previously installed at the original floor level of the North LN placement area. Seepage reports to the lined LN Pond 2 (Plate 4). Planning for surface water to report to additional lined storage ponds is in place.

Plate 4 Lined LN Pond 2

Based on site observations and information reviewed potential impacts from the operation of the LNAR regarding erosion and sediment control have been effectively mitigated and managed.

7.4.3 Reportable Incidents

No reportable incidents have been recorded regarding erosion and sediment controls for the reporting period.

7.4.4 Further Improvements

No further improvements have been identified for the next reporting period.

8. Landscape and Revegetation

8.1.1 Environmental Management

During the reporting year, no rehabilitation work was undertaken. Rehabilitation works at the LNAR is planned to occur when the 937m contour layback has been constructed around the perimeter of the ash repository. The completion of the 937m contour layback is anticipated to occur during the 2022 reporting year.

8.1.2 Environmental Performance

Ash Placement activities at the LNAR were undertaken within the existing capping levels. As such no additional land preparation or rehabilitation work was required during the reporting period. The rehabilitation status of the LNAR is detailed in Table 16. The rehabilitation status of the Lamberts North and the adjoining Mt Piper Ash Repository is shown in Appendix E.

Table 16 Rehabilitation Status

Area Type	Prev. Reporting Period Sept 2019 – Aug 2020 Hectares	This Reporting Period Sept 2020 – Aug 2021 Hectares	Next Reporting Period Sept 2021 – Aug 2022 Hectares
Total Footprint	19.8	19.8	19.8
Total active disturbance	16.7	16.7	16.7
Land being prepared for rehabilitation	1.30	0	0
Land under active rehabilitation	0	1.30	1.3
Completed rehabilitation	0	0	0

8.1.3 Reportable Incidents

No reportable incidents have been recorded against landscape and revegetation management for the reporting period.

8.1.4 Further Improvements

No further improvements have been identified for the next reporting period.

9. Community

9.1 Community Engagement

During the reporting period Community Consultation Committee (CCC) meetings were held on 7 September 2020, 7 December 2020, and 1 March 2021. A Community Reference Group meeting was scheduled for 17 August 2021 but was cancelled due to COVID-19 restrictions. The CCC comprises representatives from the local community and EA NSW. The CCC meets three times per year to discuss matters relating to operations at MPPS, including activities at the ash repositories – MPAR and LNAR. The CCC minutes are made publicly available via the Mt Piper Community page on EA NSW website www.energyaustralia.com.au.

9.2 Community Contributions

The MPPS and the associated LNAR has contributed to the economy of the district and State through the purchase of materials and services from local and regional suppliers, and by direct and indirect employment. EA NSW continues to support a number of community groups and organisations through in-kind support and financial sponsorship programs. During the reporting period, EA NSW had the opportunity to support up to 60 different community organisations and events during the reporting period. A list of these organisations and events are included in Appendix I.

9.3 Community Complaints

There were no community complaints reported to EA NSW relating to the LNAR during the reporting period (Appendix J). EA NSW maintains a 24-hour hotline for the public to report incidents, complaints or enquiries with contact details available on the EnergyAustralia website. EA NSW records the details of all complaints received in a Complaints Register.

9.4 Website Information

A project specific webpage has been developed to keep the broader community up to date with recent activities at the LNAR in accordance with CoA B10. Copies of the following documents are made publicly available on the EA NSW website:

https://www.energyaustralia.com.au/about-us/energy-generation/mt-piper-power-station

- Environment Assessment
- Project Approval 09_0186
- Construction Environment Management Plan
- Operation Environmental Management Plan
- Annual Environmental Management Reports
- Environment Protection Licence 13007
- Pollution Incident Response Management Plan
- CCC Minutes
- Modification 1 Report and Response to Submissions

10. Independent Environmental Audit

10.1 Independent Environmental Audit

Actions from the independent environmental audit performed in October 2018 (SLR, 2018) that are yet to be closed out are detailed below.

Table 17 Audit response action timeline

Recommendation Number	Recommendation	EnergyAustralia NSW Response	Proposed date of completion
9	Include DPI Water response in Appendix E (Stakeholders Consultation) of the OEMP	Noted, recommendations 9, 10, 11, and 12 will be incorporated into the OEMP when updated. An independent groundwater investigation has been commissioned by EA NSW. The DPIE, EPA and Water NSW have been consulted throughout this process to-date. The independent groundwater investigation is ongoing and anticipated to be progressively completed throughout 2022. During the reporting period, EA NSW submitted a modification to the PA 09_0186 Mt Piper Ash Placement LNAR Project Approval. The modification relates to the installation of a leachate barrier system (low permeability liner) and leachate management system to restrict the escape of leachate from the LNAR. The OEMP will be updated at the completion of the independent groundwater investigation.	Ongoing - 2022
10	Update the Groundwater Management Plan following the completion of the independent groundwater investigation		
11	Include a site water balance in the OEMP		
12	Undertake further assessment and an independent investigation of surface water in the vicinity of the LNAR		
	Clarify with EPA whether or not stainless-steel clips and mild steel caps are permitted to be disposed of at LNAR	Submission lodged with the EPA seeking clarification for disposal of these items. Response from EPA received 24 March 2021 clarifying that the EPA "considers all components of the fabric filter bags to be one item. No additional disposal requirements are recommended at this time."	Complete.

10.2 Environmental Representative Audit

An internal audit was conducted on the ash placement and ash management commitments detailed in Sections 2.23 Ash Placement, 2.2.4 Ash Management and Table 6.11 Mitigation Measures of the OEMP (EA NSW, 2021). No non-compliance matters were identified. The report can be found in Appendix K.

11. Activities Proposed in the next reporting period

EA NSW has reviewed its ash management and brine disposal arrangements and has submitted a Modification to PA 09_0186 to the DPIE. Should approval be granted, relevant Environmental Management Plans will be updated accordingly.

Activities to be conducted in the next reporting period will include:

- Ash placement into LNAR building to 937m external layback.
- Continue marketing the reuse of fly ash to cement manufacturers and other potential users.
- Dust suppression activities to minimise potential air quality impacts from the LNAR.
- Environmental compliance monitoring for noise emissions, air quality and water quality.
- Execution of the Conservation Agreement with BCT for the BOA. Undertake the necessary management actions as outlined and required by the Conservation Agreement.
- Continue monitoring the ecological health of Wangcol Creek throughout the life of the Project. The monitoring will continue after final capping of the LNAR for a minimum of five years in accordance with approval conditions.
- Water management works including the maintenance of sediment and erosion control structures.
- Continue the independent assessment of groundwater and surface water conditions .
- Following approval of the LNAR Mod 1, undertake a review of new conditions and develop workstreams for compliance as necessary.

11.1 Environmental Management Targets and Strategies for the Next Year

Environmental measures to be implemented in the next reporting period are detailed in Table 18.

Table 18 Measures to be implemented in the next reporting period

Environment Management Area	Target / Strategy	Timeframe
Water Quality	Review the groundwater management and monitoring plan	Following completion of the independent groundwater investigation and in consideration of the pending LNAR Mod 1 conditions of approval.
Water Quality	Implement mitigation and control measures to manage potential groundwater and surface water impacts	2020 onwards.

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13. Glossary of Terms

AEMR	Annual Environmental Management Report
AHD	Australian Height Datum
ANZECC	Australian & New Zealand Environmental & Conservation Council
AQMP	Air Quality Management Plan
AQMS	Air Quality Monitoring Station
BCA	Brine-conditioned Ash
BCT	Biodiversity Conservation Trust
BOA	Biodiversity Offset Area
BOM	Bureau of Meteorology
BOMP	Biodiversity Offset Management Plan
CCC	Community Consultative Committee
CEMP	Construction Environmental Management Plan
CoA	Conditions of Approval (Project Approval 09_0186)
dB	decibel
DE	Delta Electricity
DPE	Former Department of Planning & Environment
DPI	Former Department of Planning & Infrastructure
DPIE	Department of Planning, Industry & Environment
DPI-Water	Former Department of Primary Industries - Water
EA NSW	EnergyAustralia NSW
ELA	Eco Logical Australia
EMP	Ecological Monitoring Program
EPA	Environment Protection Authority
EP&A Act	*Environment Planning & Assessment Act 1979*
EPL	Environment Protection Licence
ERM	Environmental Resources Management Australia Pty Ltd
GMMP	Groundwater Management & Monitoring Plan
ha	hectares
LLS	Local Land Services
LN	Lamberts North
LNAR	Lamberts North Ash Repository
LSAR	Lamberts South Ash Repository
m	metres
m/s	Metres per second
Mod	Modification
MPAR	Mt Piper Ash Repository
MPPS	Mt Piper Power Station
MW	Megawatt

NEMMCO	National Electricity Markey Management Company
NEPM	National Environmental Protection Measures
NRAR	Natural Resource Access Regulator
NSW	New South Wales
OEH	Office of Environment & Heritage
OEMP	Operational Environmental Management Plan
ONMMP	Operational Noise Management & Monitoring Plan
PM	Particulate Matter
POEO Act	*Protection of the Environment Operations Act 1997*
SoC	Statement of Commitments
SPL	Sound Power Level
SSWMP	Soil & Surface Water Management Plan
T	tonnes
TEOM	Tapered Element Oscillating Membrane
TSP	Total Suspended Particulates
WAL	Water Access Licence
WMP	Waste Management Plan
WQMR	Water Quality Monitoring Report
$\mu g/m^3$	Microgram per cubic metre