Capping Strategy

Mt Piper Power Station, DA80/10060, Mt Piper Ash Repository

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Capping Strategy

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ACRONYMS AND ABBREVIATIONS

Acronym	Description
AHD	Australian Height Datum
BCA	Brine Conditioned Ash
CCC	Community Consultative Committee
Currently Approved WMP	ERM, 2020. Water Management and Monitoring Plan Update for 60 ML Dam – Mt Piper Power Station Brine Conditioned Fly Ash Co-Placement Extension Water Management and Monitoring Plan.
CSM	Conceptual Site Model
DCCEW	Department of Climate Change, Environment and Water
DPHI	Department of Planning, Housing and Infrastructure
EC	Electrical Conductivity
EMR	Environmental Monitoring Report
EPA	Environment Protection Agency
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EPL	Environment Protection License
ERM	Environmental Resources Management
HELP	Hydrologic Evaluation of Landfill Performance
IFC	Issued for Construction
km	kilometres
LBMS	Leachate Barrier Management System
LCC	Lithgow City Council
LGA	Local Government Area
LLDPE	Linear Low Density Polyethylene
LNAR	Lamberts North Ash Repository
LNAR Mod 1	Modification 1 to the LNAR Project Approval
LNAR Project Approval	Project Approval (PA) 09_0186
m	metres
mm	millimetres
m/s	metres per second
MOA	Mitigation Options Assessment
Mod 9	Modification 9 to the Mt Piper Consent
Mt Piper Consent	Development consent DA80/10060
MPAR	Mt Piper Ash Repository
MPAR Phase 1 Capping and Drainage	The installation of a low-permeability cap and associated water management features on the MPAR, as authorised by Mod 9.
MPAR Zone 2 LBMS and Capping	The installation of a LBMS and capping in MPAR Zone 2, as authorised by Mod 9.

Acronym	Description
MPPS	Mt Piper Power Station
MW	Megawatts
NEM	National Electricity Market
NEPC	National Environmental Protection Measure
NGM	Numerical Groundwater Model
NP	Net Percolation
NRAR	National Resources Access Regulator
NSW	New South Wales
OEMP	Operational Environmental Management Plan
PA	Project Approval
POEO Act	Protection of Environmental Operations Act 1997 (NSW)
Previously Approved WMP	Connell Wagner, 2008. Mt Piper Power Station Brine Conditioned Flyash Co-placement Extension Water Management and Monitoring Plan.
Site	Mt Piper Ash Repository
SPR	Source-Pathway-Receptor
SSD	State Significant Development
SWTP	Springvale Water Treatment Project
TDS	Total Dissolved Solids
Updated WMP	ERM, 2025. Water Management Plan, Mt Piper Power Station, DA80/10060.
VLEACH	Vadose Zone Leaching Model
WCA	Water Conditioned Ash
WMP	Water Management Plan

1. INTRODUCTION

EnergyAustralia NSW Pty Ltd (EnergyAustralia) engaged Environmental Resources Management Australia Pty Ltd (ERM) to prepare this Capping Strategy for the Mt Piper Ash Repository (MPAR) at the Mt Piper Power Station (MPPS), Boulder Road, Portland, New South Wales (NSW) (Site).

The MPPS is located within the Lithgow Local Government Area (LGA), approximately 110 kilometres (km) west of Sydney and five km east of Portland NSW. The location of the MPPS in a regional context is presented in Figure 1 (Appendix A).

The Capping Strategy has been prepared to address the requirements of Condition 59 of development consent DA80/10060 as modified by Modification 9, approved on 24 June 2025 (Mt Piper Power Consent). This Capping Strategy should be read in conjunction with the Statement of Limitations (Appendix B).

1.1 BACKGROUND

1.1.1 DEVELOPMENT OF THE MPPS

EnergyAustralia owns and operates the MPPS. The MPPS was authorised by the Mt Piper Consent which was originally granted under the Environmental Planning and Assessment Act 1979 (NSW) (EP&A Act) on 1 April 1982. The Mt Piper Consent has been modified on nine occasions, with the most recent being Modification 9, approved on 24 June 2025. The Mt Piper Consent as modified authorises the MPPS and ancillary activities, including the ongoing operation of the MPAR.

The MPPS was built between 1984 and 1993 and comprises two coal-fired steam turbine generating units. Each unit was originally constructed to generate up to 660 megawatts (MW); however, they have since been upgraded to utilise improvements in turbine technology. The generating units now produce up to 700 MW and 730 MW, respectively.

The MPPS provides critical electricity supply into the National Electricity Market (NEM) and will continue to operate until it is retired by 2040 in line with the commitments contained in EnergyAustralia's Climate Transition Action Plan 2024.

1.1.2 THE ASH REPOSITORIES

The MPPS has two approved and operating ash placement repositories:

- The MPAR, which was originally approved under development consent DA230/89 granted by Lithgow City Council on 21 March 1980. DA230/89 was incorporated, via subsequent modifications, into the Mt Piper Consent. Most of the ash produced at MPPS to date has been placed within the MPAR; and
- The adjoining Lamberts North Ash Repository (LNAR), which was separately approved in February 2012 under Project Approval (PA) 09_0186 (LNAR Project Approval) as modified, is located immediately adjacent to the MPAR.

The MPAR and the LNAR are collectively referred to as the 'Ash Repositories'. This Capping Strategy has been prepared to address the requirements of Condition 59 of the Mt Piper Consent and relates solely to the MPAR. This Capping Strategy does not apply to the adjoining LNAR which, as outlined above, is separately authorised under the LNAR Project Approval. However, this Capping Strategy has been prepared with regard to the approved final landform for the adjoining LNAR, as authorised under the LNAR Project Approval.

1.1.3 ASH PLACEMENT

Prior to the placement of fly ash within the Ash Repositories, the fly ash is conditioned to increase its moisture content to achieve required compaction and to maintain geotechnical stability as well as to assist in dust suppression. The fly ash is conditioned by the addition of either:

- Water, sourced in accordance with existing MPPS water licences and allocations, including recycled process water and fresh (non-potable) water. Fly ash treated with water is referred to as Water Conditioned Ash (WCA). WCA is permitted to be placed within all areas of the MPAR and has been placed into the MPAR since 1993; or
- Brine, a by-product from:
    - Treatment of evaporative cooling water from the cooling towers of MPPS to remove salts and impurities. Treatment at the MPPS Brine Concentrators is approved under the Mt Piper Consent; and
    - The Springvale Water Treatment Project (SWTP) which is located adjacent to the MPPS and was separately approved under State Significant Development (SSD) 7592 (the SWTP Consent).

  Fly ash treated with brine is referred to as brine conditioned ash (BCA). BCA was authorised to be placed into the MPAR within the MPAR Stage 1 (from 2000) and Stage 2 (from 2008) BCA placement areas at elevations above 946 metres Australian Height Datum (m AHD) and up to 980 m AHD. Key features of the MPPS and the MPAR are presented in Figure 2 (Appendix A). Placement of BCA in unlined areas of the MPAR has now ceased. Accordingly, ongoing placement of BCA within the MPAR will only occur in the new engineered lined facility to be constructed on the eastern end of the MPAR as authorised by Modification 9 to the Mt Piper Consent (referred to as the MPAR Zone 2 LBMS, as described in the following subsection).

1.1.4 THE INDEPENDENT GROUNDWATER INVESTIGATION AND MOD 9

As outlined in the currently approved MPAR Water Management and Monitoring Plan (ERM, 2020) (the Currently Approved WMP), which remains in effect under Condition 43C of the Mt Piper Consent, and the updated draft MPAR Water Management Plan (ERM, 2025) prepared and submitted under Condition 43 of the Mt Piper Consent (referred to as the updated WMP in this Capping Strategy), EnergyAustralia has routinely monitored electrical conductivity (EC), major ions and trace metal concentrations in groundwater and surface water to assess potential effects from ash placement activities at the MPAR, and the adjoining and separately approved LNAR. The results of this monitoring are reported annually (e.g. ERM, 2024) in accordance with the requirements of the Mt Piper Consent.

As detailed in the annual reports, the monitoring results indicated elevated concentrations of total dissolved solids (TDS) and other ions in surface water and groundwater in the vicinity of

the MPAR. In this area, TDS is used as a marker for solutes that have entered the local groundwater via leaching from BCA at the MPAR, and includes elevated chloride, sulfate and related dissolved metals.

In accordance with the contingency measures outlined in the previously approved Water Management and Monitoring Plan (Connell Wagner, 2008) (the Previously Approved WMP), due to these monitoring results, in 2016 ERM was engaged to complete the Independent Groundwater Investigation (2016-2023) associated with the elevated concentrations of key indicator analytes (EC, TDS, sulfate, chloride, boron, manganese and nickel) in groundwater and surface water that have since been attributed to leaching and seepage associated with BCA placement within the MPAR. As detailed further in Section 4.1, this investigation concluded that:

- The elevated concentrations of TDS in groundwater in the vicinity of the Ash Repositories are predominately associated with the historical placement of BCA in the MPAR as a result of recharge (i.e. percolation of rainfall through the placed ash) and leaching processes of the placed BCA; and
- Application of a low permeability cap over an area of BCA would be effective in slowing the rate of solute migration to regional groundwater (i.e. recharge control), thereby reducing the resulting solute concentrations that migrate beyond the base of the MPAR into the underlying groundwater system and ultimately receiving surface water.

These findings have informed a number of operational changes to the MPAR as authorised as part of modification 9 to the Mt Piper Consent (Mod 9), including the installation of a low-permeability cap and associated water management features on the MPAR (MPAR Phase 1 Capping and Drainage) and installation of a leachate barrier management system (LBMS) and capping in MPAR Zone 2 (MPAR Zone 2 LBMS and Capping), as detailed below:

The MPAR Phase 1 Capping and Drainage encompasses:

- Installation of an engineered capping layer on the top section of the MPAR (MPAR Phase 1 Capping); and
- Construction of engineered structures and upgraded surface water drainage systems to direct clean water flows from the MPAR Phase 1 Capping, and existing MPAR batters and benches to Wangcol Creek (MPAR Phase 1 Drainage).

The MPAR Zone 2 LBMS and Capping encompasses:

- Installation of an engineered liner and leachate collection system on the eastern end of the MPAR (MPAR Zone 2 LBMS); and
- Installation of an engineered capping layer at the completion of ash placement in MPAR Zone 2 (MPAR Zone 2 Capping).

As outlined above, all placement of BCA in unlined areas of the MPAR has now ceased.. Following installation of the MPAR Zone 2 LBMS, future BCA placement in the MPAR will be limited to Zone 2 within the MPAR Zone 2 LBMS, and subject to management in accordance with the controls outlined in Sections 5 to 9 of the updated WMP. Following the completion of ash placement operations at the MPAR, the MPAR Zone 2 Capping will be capped and rehabilitated to be tied into the MPAR Phase 1 Capping so as to form an engineered capped surface across the entire upper portion of the MPAR.

As a result of the preliminary findings of the Independent Groundwater Investigation, in September 2021, the LNAR Project Approval was modified to authorise amendments to the design and operations of the LNAR (LNAR Mod 1), principally, the installation of a LBMS, with BCA placement approved within the lined areas. The approved final landform for the MPAR as authorised by Mod 9 to the Mt Piper Consent has also been designed to integrate with the separately approved final landform for the LNAR.

These operational changes are intended to achieve the environmental performance objectives for the future decommissioning of the MPAR, as presented in Section 5.1 of the updated WMP, while supporting the long-term potential for reclamation and beneficial reuse of ash in the future should further market opportunities eventuate.

2. REGULATORY REQUIREMENTS

2.1 DEVELOPMENT CONSENT

This Capping Strategy has been prepared to satisfy the requirements under Development Consent DA80/10060 Condition 59(a) and (b) as replicated below in Table 2.1.

TABLE 2-1 REQUIREMENTS OF CONDITION 59 FOR THIS CAPPING STRATEGY

Mt Piper Consent Requirements	Where addressed in this Capping Strategy
Within six months of approval of Modification 9, or other timeframe agreed by the Secretary, the Applicant must develop a capping strategy for the entire MPAR to the satisfaction of the EPA. The design for the MPAR capping strategy must provide details of: (a) short, medium and long-term solutions for control of migration of the solutes from the entire MPAR and into the receiving environment, including consideration of post-closure measures; and (b) additional works required and assessment of measures to reduce water infiltration on the batter slopes of the MPAR."	a) Section 3 and Section 4 of this Capping Strategy provide an overview of the short, medium-and long-term strategies being implemented and additional options being considered. b) Section 3.3.3 of this Capping Strategy outlines the assessments being undertaken to inform additional works to reduce water infiltration on the batter slopes of the MPAR.

2.2 ENVIRONMENT PROTECTION LICENCE 13007

The MPPS (including the MPAR and the LNAR) is also regulated under the Environment Protection Licence 13007 (EPL) granted under the Protection of the Environment Operations Act 1997 (NSW) (the POEO Act).

The EPL, as varied on 10 December 2025, included Condition U1: Wangcol Creek Remediation Feasibility Study "*to address any potential ongoing impacts by seepage*" from the MPAR to parts of Wangcol Creek.

The Wangcol Creek Remediation Options Feasibility Study required by this condition was finalised and submitted to the EPA as required. Section 4 of this Capping Strategy contains a summary of the outcomes of the Wangcol Creek Remediation Feasibility Study .

The implementation of any options assessed as feasible in line with the Wangcol Creek Remediation Options Feasibility Study are not authorised by the Mt Piper Consent and will, if required to be implemented, require further separate approvals. The Capping Strategy will be updated to reflect any changes to relevant planning approvals.

2.3 PURPOSE OF THE CAPPING STRATEGY

In the context of the above background and regulatory requirements, the purpose of the Capping Strategy is to:

1. Present the final landform and associated closure related works for the MPAR as currently authorised under the Mt Piper Consent;
2. Present the short, medium and long-term solutions for control of migration of the solutes from the entire MPAR and into the receiving environment, including consideration of post-closure measures; and
3. Outline the process that identifies whether additional works are required to reduce water infiltration on the batter slopes of the MPAR and, if so, confirm the works proposed.

As outlined above, the Mt Piper Consent applies to the MPPS, including the MPAR, and does not apply to the LNAR (which is separately approved under the EP&A Act) or Wangcol Creek (which is outside the footprint authorised under the Mt Piper Consent). Accordingly, this Capping Strategy is limited to works within the approved boundaries of the MPAR, consistent with the Mt Piper Consent.

The following definitions have been applied when referring to timeframes as part of this Capping Strategy:

- Short-term means within 3 to 5 years;
- Medium-term means from 5 years, to within 20-30 years; and
- Long-term means greater than 30 years.

3. APPROVED FINAL LANDFORM AND CAPPING WORKS

As outlined in Section 1.1.4, operational changes at the MPAR have been authorised as part of Mod 9, including the MPAR Phase 1 Capping and Drainage and the MPAR Zone 2 LBMS and Capping, and associated works. The operational changes were informed by findings of the Independent Groundwater Investigation, including development of the conceptual site model (CSM) and modelled source-pathway-receptor (SPR) linkages related to the BCA placement within the MPAR and the assessment of mitigation options relating to management of seepage of BCA leachate from the MPAR, resulting in the approved final landform and capping works, as outlined in the following subsections.

3.1 MODELLED SOURCE-PATHWAY-RECEPTOR LINKAGES

The Groundwater Flow Model Report (ERM, 2023a) presents a summary of the CSM and SPR linkages related to BCA placement within the MPAR. The primary pathway for migration of solutes derived from BCA in the MPAR is by the vertical migration of leachate (water sourced from rainfall and irrigation across the MPAR) down through the BCA placed within the MPAR. Once the leachate reaches the base of the ash at the MPAR, the vertical migration of leachate is assumed to continue until it mixes with the regional water table that underlies the Site.

Groundwater that flows to the east from the MPAR is primarily received by DML Dam and Cooks Dam due to the higher hydraulic conductivity of mined out areas. A portion of the groundwater that flows to the north-east and east from the MPAR is received by Wangcol Creek at Areas D, E and G, as indicated by relative groundwater and creek elevations and water quality where former open cuts are present in the creek. Consequently, these sections of Wangcol Creek and their associated ecosystems and downstream waterways are receptors of groundwater that have the potential to be impacted because of previous BCA placement in the MPAR.

The groundwater flow model indicates that groundwater is also likely to continue as underflow beyond Wangcol Creek, towards the historical Wallerawang Underground Mine and Eastern Main Underground Mine. There are no registered users of groundwater in proximity to the Site, and one registered domestic household bore located east of the historical Eastern Main Underground Mine, approximately 3 km south-east of the MPAR (ERM, 2023a).

Therefore, a complete SPR linkage is present for Wangcol Creek, but no other potentially complete SPR linkages have been identified in relation to groundwater that is impacted by seepage of BCA leachate from the MPAR.

3.2 MITIGATION OPTIONS ASSESSED

The Numerical Groundwater Modelling - Groundwater Flow Model Report, Appendix B (ERM, 2023a), presents a mitigation options assessment (MOA) (the 2023 MOA) and outcomes relating to the management of seepage of BCA leachate from the MPAR. The 2023 MOA was originally developed by ERM (2018) and was further developed by Water Technology Pty Ltd (2020). Each of these separate MOAs were prepared in the context of the SPR framework, as described in the National Environment Protection (Assessment of Site Contamination) Measure 1999, (NEPC, 1999).

Several source controls, pathway controls and receptor controls were previously assessed, and several mitigation options for these were subject to detailed assessment. Of these, several mitigation options have been approved for implementation (as outlined in Section 3.3), while others were deemed to be unfeasible, as detailed in the following subsections.

The 2023 MOA provides a complete summary of the options that have been previously assessed and discarded, including the justification.

3.2.1 PATHWAY CONTROL

A Hydraulic Control Barrier option was assessed in light of the findings from the separate MOAs and focused on the use of hydraulic control to limit groundwater entering Wangcol Creek. One sub-option considered was the installation of a horizontal interception trench. Another sub-option was the use of shallow groundwater interception bores. Each of these options involved extracting shallow groundwater with elevated TDS near Wangcol Creek and before it discharged into Wangcol Creek, so as to reduce the volume of groundwater contributing to elevated TDS at Wangcol Creek, whilst reducing impacts to groundwater hydraulically upgradient of Wangcol Creek.

Following these MOAs, a hydraulic control barrier option using shallow groundwater interception bores was considered in detail for implementation in the short to medium-term. This project was termed the groundwater interception project and involved intercepting groundwater migrating from the MPAR to Wangcol Creek (i.e. pathway interruption) using a network of groundwater interception and associated monitoring bores. However, it would not have reduced solutes entering groundwater from the MPAR in contrast to the capping option selected to provide source control through recharge reduction which was assessed as preferrable to the groundwater interception project option.

The groundwater interception project option proposed the installation and operation of several groundwater interception bores and an in-stream pumping system at Area D within Wangcol Creek. Water transfer and storage infrastructure specific to this project would have also been required, including a water transfer pipeline beneath the Castlereagh Highway and additional lined ponds.

Pilot works were undertaken to further investigate the feasibility of the groundwater interception project option and included drilling several scout holes and the installation of several monitoring bores and test interception bores, along with associated pumping, to assess the performance of the system and inform detailed design should it be confirmed as feasible. Based on the proximity of the groundwater interception bores to the creek, the modelled scenarios from the pilot indicated that some reduction in the discharge of groundwater impacted with elevated levels of TDS resulting from BCA placement in the MPAR into Wangcol Creek would occur (ERM, 2021) from the groundwater interception project option, thereby reducing impacts to Wangcol Creek.

In light of these initial favourable findings, the groundwater interception project was advanced to approximately 80% detailed design stage (MSA, 2021a). However, a review of the chemistry, particularly iron concentrations in groundwater, of the intercepted groundwater, together with further assessment of the volume of water (~1 megalitres per day) that would be intercepted and which would require treatment, confirmed that the groundwater was not of a suitable quality or quantity to be able to be treated using the Mt Piper Water Treatment Plant and brine concentrators. Rather, the intercepted water would have required further pre-treatment to reduce the naturally-occurring concentrations of ferrous iron to mitigate the high risk of significant fouling of the brine concentrator system and would have also resulted in additional waste streams requiring handling and disposal. These issues were further assessed in MSA (2021b) which presented a summary of the pre-treatment options and provided a cost estimation of the preferred option (being aeration, sodium hydroxide dosing, chemical oxidation, reactor and clarifier), which confirmed that, based on the volume and quality of water to be intercepted and the level of pre-treatment required as well as sustainability considerations, the groundwater interception project was not a feasible option. It was accordingly discontinued and Mod 9 was formulated in its place, which focused on recharge control strategies as outlined at Section 3.3 below.

3.3 RECHARGE CONTROL STRATEGIES

Recharge control at the MPAR (i.e. source control) was identified (ERM, 2023a) as the key mitigation option to control groundwater impact related to the MPAR in the longer term. The source control option (through capping, enhanced surface water runoff and augmented recharge controls) provides a means of reducing the volume, and increasing the timeframe, of infiltration through the MPAR, thus reducing the resulting solute concentrations that migrate beyond the base of the MPAR into the underlying groundwater system and ultimately receiving surface water (ERM, 2023b, 2023c).

Source control through recharge reduction has been confirmed to be the most reasonable and feasible mitigation option for implementation once the MPAR reaches its final approved ash placement extent and was accordingly progressed and approved via Mod 9. The recharge (source) control strategies for the MPAR are captured in three main work streams, including MPAR Phase 1 Capping and Drainage (Section 3.3.1), the MPAR Zone 2 LBMS and Capping (Section 3.3.2), and additional recharge control options being assessed in relation to remaining MPAR batter slopes and benches (Section 3.3.3). The design intent for each of these work streams is to possess sufficient strength, flexibility and durability to ensure performance throughout the MPAR decommissioning process and post-closure.

3.3.1 MPAR PHASE 1 CAPPING AND DRAINAGE

The detailed design for MPAR Phase 1 Capping and Drainage, as authorised by the Mt Piper Consent (Mod 9), has been issued for construction. Construction of the MPAR Phase 1 Drainage improvements is currently underway, and construction of the MPAR Phase 1 Capping and Drainage design is forecast for completion by the end of June 2026. Key diagrams issued for construction by GHD (2025) are provided as Appendix D.

The following subsections provide an overview of the key components of the MPAR Phase 1 Capping and Drainage.

3.3.1.1 MPAR PHASE 1 CAPPING

The MPAR Phase 1 Capping detailed design was completed by GHD and final issued for construction designs were provided in August 2025 (GHD, 2025). The MPAR Phase 1 Capping comprises of (from top to bottom):

- 1 m thick layer of vegetation growth medium and associated revegetation;
- Sub-surface drainage (within or immediately below the growth medium);
- Linear low-density polyethylene (LLDPE) geomembrane liner; and
- Seal bearing layer (consisting of placed ash material).

The MPAR Phase 1 Capping will involve installation of a low-permeability engineered capping layer, consisting of the LLDPE geomembrane liner, on the top section of the MPAR to mitigate infiltration of water (recharge) and subsequent leachate generation from BCA into underlying groundwater. The MPAR Phase 1 Capping will provide ongoing leachate management for the upper section of the MPAR that contains the most recently placed BCA and Solid Mixed Salts. The capping of the upper section of the MPAR will also provide a better opportunity for potential beneficial reuse of ash placed in the MPAR in the future, subject to further assessment of reuse options and their feasibility, when compared to a more extensive capping scenario.

The MPAR Phase 1 Capping will be revegetated with ground cover aligned with the outcomes of Section 3.3.3.3

3.3.1.2 MPAR PHASE 1 DRAINAGE

The MPAR Phase 1 Drainage detailed design was completed by GHD with issued for construction designs being provided in August 2025 (GHD, 2025). Indicatively, the MPAR Phase 1 Drainage detailed design is comprised of:

- Chute and bench toe designs, including:
  - Chute Drains, with a 300 millimetre (mm) compacted subgrade topped with 300 mm rock mattresses (D50: 100 - 150 mm), underlined with geotextile (for erosion control) and a geomembrane (for seepage control).
  - Bench Toe Drains, as either:
    - Type 1: Topsoiled and grassed, for a maximum velocity of 1.5 metres per second (m/s). This type varies in depth at MPAR between 500 mm where the geomembrane is located to 700 mm where no geomembrane will be constructed; and
    - Type 2: 400 mm thick rock layer (D50: 200 mm) or a 170 mm thick rock mattress (D50: 70 - 100 mm) for a maximum flow velocity of 2.5 m/s.
  - Outlet Channels, as either:
    - Type 1: Either a 400 mm thick rock layer (D50: 200 mm) or a 170 mm thick rock mattress (D50: 70 - 100 mm), giving the Contractor the option, for a maximum velocity of 3 m/s; and
    - Type 2: 300 mm thick rock mattress (D50: 100 - 150 mm) for a maximum velocity greater than 3 m/s but less than approximately 5 m/s.
- Stilling Basins / Energy Dissipators which have been designed to include the interface with the outlet channels, designed levels and fall, rock mattress and gabion baskets.

The improved drainage design further supports recharge control and legacy leachate management at MPAR by reducing the residence time of clean runoff and therefore the potential for its infiltration. It will also increase clean water runoff flows to Wangcol Creek.

3.3.2 MPAR ZONE 2 LBMS AND CAPPING

A LBMS, as authorised by Mod 9 to the Mt Piper Consent, will be installed on the eastern end of the MPAR (Zone 2) prior to the placement of BCA and Solid Mixed Salts above the liner in that area. The MPAR Zone 2 LBMS will include:

- A leachate collection system that will be integrated with the existing LNAR leachate management system, which is managed under the LNAR Operational Environmental Management Plan (LNAR OEMP); and
- Suitable pipes and pumps to transfer leachate captured from MPAR Zone 2 prior to its transfer to the LNAR and MPPS water management system for storage and treatment.
- Installation of a low permeability engineered capping layer following the completion of ash placement activities.

The MPAR Zone 2 LBMS will be integrated with the MPAR Phase 1 Capping and with the LNAR Stage 1 LBMS. The MPAR Zone 2 LBMS will provide ongoing leachate management for the upper section of the MPAR that will contain BCA and solid mixed salts that are yet to be placed.

Figure 3-1 presents the indicative general arrangement diagram from the GHD (2025) drawing set. The MPAR Zone 2 LBMS is currently 80% completed, with final design reviews, EnergyAustralia reviews, and safety in design workshops remaining. Only minor design changes, if any, are likely to be required prior to finalisation of the MPAR Zone 2 LBMS and Capping design.

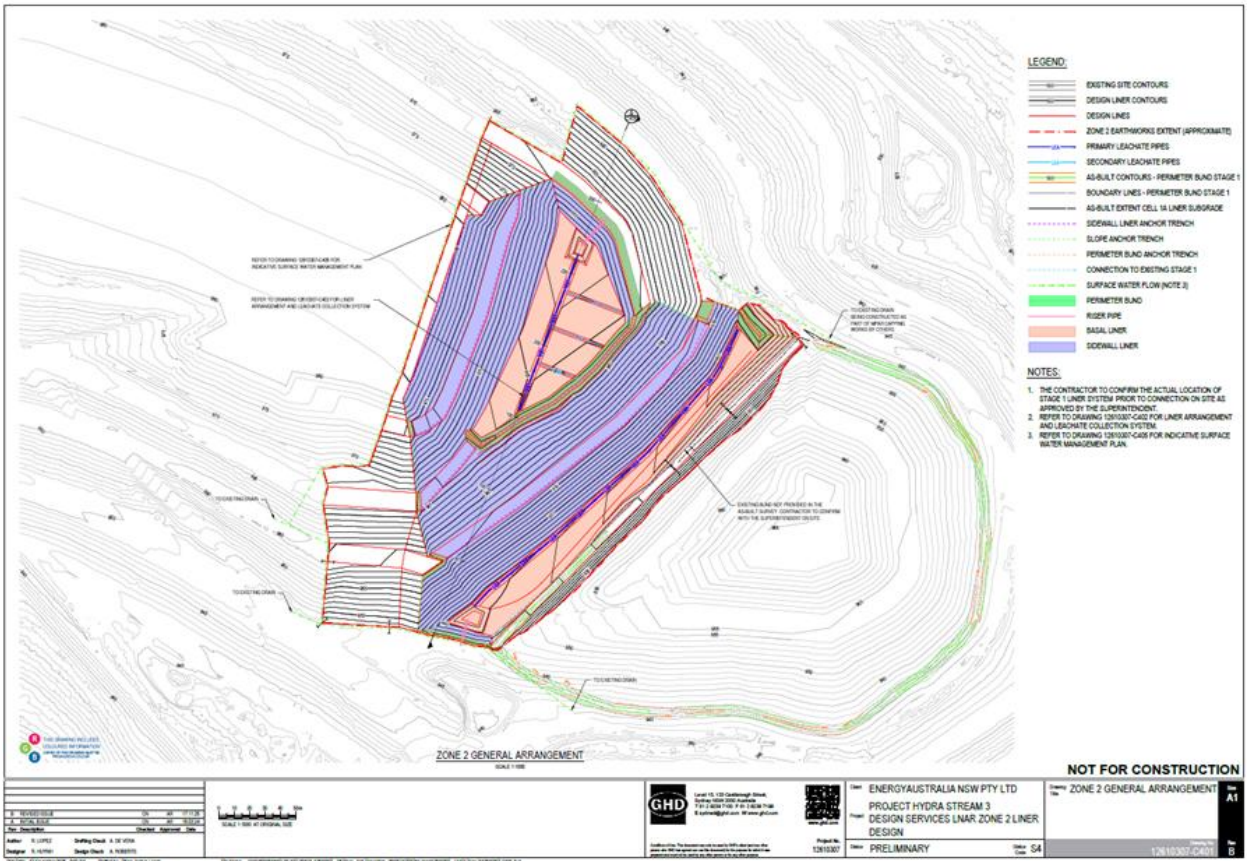


FIGURE 3-1 ZONE 2 INDICATIVE GENERAL ARRANGEMENT (GHD, 2025)

3.3.3 MPAR BATTERS AND BENCHES

The MPAR Phase 1 Capping and Drainage is intended to mitigate the ongoing contribution of solutes from historical MPAR Stage 1 and Stage 2 BCA placement areas to local groundwater via the control of recharge beyond the capping footprint. However, as the MPAR Phase 1 Capping and Drainage has been designed over a portion of the historical MPAR BCA placement footprint, additional recharge control options for the uncapped historical BCA placement areas at the MPAR (i.e. to cover the entire Stage 1 and Stage 2 BCA placement footprint) were subject to further assessment (ERM, 2026a).

The objectives of this further study were to:

- Assess additional recharge control options for the portions of the MPAR Stage 1 and Stage 2 BCA placement footprint that are not beneath the MPAR Phase 1 Capping and Drainage, i.e. predominantly the batter slopes; and
- Present recommendations regarding the most reasonable and feasible additional recharge control option based on the modelled influence on the source term.

The study was undertaken via field investigation, laboratory analysis and additional modelling of defined recharge control scenarios for the MPAR batters and benches, including:

- Hydrologic Evaluation of Landfill Performance (HELP) (USEPA, 2020) modelling to assess the potential effectiveness of alternative recharge controls by evaluating changes in net infiltration under the defined recharge control scenarios; and
- Vadose Zone Leaching Model (VLEACH) (USEPA, 2025) modelling to assess potential leachate concentrations predicted to result from the MPAR and enter the underlying groundwater system under the defined recharge control scenarios.

The following provides summary of key outcomes from the assessment.

3.3.3.1 WATER BALANCE PREDICTIONS

The water balance predictions from the HELP Model show that the amount of water reporting as net percolation (NP) can be significantly reduced through the application of various recharge control treatments. The application of the MPAR Phase 1 Capping and Drainage, and the existing vegetation on the MPAR batter slopes are predicted to result in a 43% reduction in NP against the modelled base case (the previously approved decommissioning scenario). Establishing vegetation cover on all batters >946 m AHD was predicted to further reduce NP, by around 71-72% against the base case. A mixture of grasses and shrubs was not predicted to have a material benefit over ground cover vegetation.

Further, as the batter slopes account for ~75% of the uncapped MPAR Stage 1 and Stage 2 BCA placement footprint, the application of additional recharge controls over these areas will have the most influence on the source term and groundwater conditions in the long-term compared to the benches, which will remain as trafficable areas long-term.

3.3.3.2 SOLUTE LEACHATE PREDICTIONS

Leachate predictions under varying recharge control scenarios, using HELP-derived NP rates as input, indicate that implementing grass and/or shrub cover on all MPAR batters >946 m AHD delivers the best overall performance of the recharge control options that were assessed.

The VLEACH Model predicted that implementation of grass and/or shrub cover would improve the cumulative solute mass discharged from the BCA to underlying groundwater by around ~80% of the base case, and each grass and/or shrub cover scenario was modelled as being within ~1-2% of each other in terms of reduced solute mass discharge as a relative percentage of the base case.

3.3.3.3 OUTCOMES

The ERM (2026a) assessment of additional recharge control options has predicted similar performance improvements for each of the grass and/or shrub cover arrangements for assessed for batter slopes outside of the MPAR Phase 1 Capping footprint, both in terms of reduction in net percolation and reduction in cumulative solute mass discharged from the BCA to underlying groundwater.

The ERM (2026a) assessment identified that application of ground cover vegetation on all MPAR batters >946 m AHD is the most reasonable and feasible additional recharge control option, given that a mixture of grasses and shrubs is unlikely to have a material benefit over ground cover vegetation. Further, ground cover vegetation is likely to be more practical to implement, as ground cover vegetation is easier to establish and maintain when compared to a mixture of grasses and shrubs, and it will also require less bushfire risk management.

Laboratory testing indicated that some level of soil improvement will be required to assist with revegetation efforts on MPAR batters. The degree of soil improvement will depend on the groundcover vegetation species/mix selected for planting. Therefore, an assessment of suitable ground cover species and associated amelioration requirements will be conducted to inform the implementation of rehabilitation efforts on the batters as an additional means of recharge control at the MPAR.

The assessment of suitable groundcover species and associated amelioration requirements is ongoing. The ongoing assessments will include an interim ground cover strategy that includes species that do not present limitations for potential future ash reclamation and beneficial reuse. The interim ground cover strategy will also consider vegetation that is resilient to local climatic conditions and will consider bushfire risk management.

3.3.4 RUN-OFF MANAGEMENT

As outlined in the updated WMP, surface runoff relating to these three main work streams will be managed in accordance with the following general principles:

- Runoff from exposed areas of ash (BCA and/or WCA) in the MPAR will be interconnected and managed via the LNAR leachate management system until the MPAR Phase 1 Capping and the Zone 2 Capping works are completed;
- Runoff from the completely covered external batters and benches will be directed to SW1 or SW2 for recycling, or to Wangcol Creek via the MPAR Phase 1 Drainage arrangements. Following installation of the MPAR Phase 1 Capping and Drainage on the MPAR Northern External Batter, runoff from this area will report to Wangcol Creek via a drop structure and energy dissipator as authorised by Mod 9;
- Separation of clean and dirty water streams, which are defined as
    - Clean water – water that has not contacted ash, such as runoff from permanently covered areas or stormwater from surrounding areas that is diverted away, and
    - Dirty water – water collected from disturbed areas within the MPAR. This includes runoff from the exposed ash face, work areas and haul roads that is contained on site within sediment ponds for reuse; and

- Sediment will be removed from storage ponds, when necessary, as a part of standard maintenance practice to maintain sufficient stormwater storage capacity.

Further details of MPAR soil and water management are presented in Section 7.2 of the updated WMP.

3.3.5 SUMMARY

Implementation of the MPAR Phase 1 Capping and Drainage and the MPAR Zone 2 LBMS works will improve the design of surface water drainage from the MPAR. The improved drainage design, combined with the implementation of additional recharge control options for the MPAR batters and benches further supports recharge control and legacy leachate management at MPAR by reducing the residence time of clean runoff and therefore the potential for its infiltration. Reduced infiltration will reduce recharge to the underlying BCA, thereby reducing the rate of leachate production and seepage from previously placed BCA in the MPAR to the underlying groundwater system. The improved recharge control and drainage arrangements will also increase the volume of clean water flows from the MPAR to Wangcol Creek, ultimately resulting in improved water quality outcomes in Wangcol Creek in the long-term.

4. MANAGEMENT STRATEGIES BEING IMPLEMENTED OR ADDITIONAL OPTIONS BEING CONSIDERED

As outlined in Section 3, source control through recharge reduction is the most reasonable and feasible mitigation option for implementation once the MPAR reaches its final approved ash placement extent. The recharge (source) control strategies for the MPAR are captured in three main work streams, including MPAR Phase 1 Capping and Drainage (Section 3.3.1), the MPAR Zone 2 LBMS and Capping (Section 3.3.2), and additional recharge control options being assessed in relation to remaining MPAR batters and benches (Section 3.3.3).

An overview of management strategies for the MPAR and the LNAR that have been implemented to mitigate potential water quality impacts associated with BCA placement is provided in Section 4.7 of the updated WMP.

Table 4-1 below presents a summary of the management strategies that are being implemented, an overview of the option, the status in terms of development consent staging of assessment, design and/or implementation, the likely timeline for implementation and the likely timeline for influence of water quality at Wangcol Creek.

All management strategies for the MPAR proposed to be implemented as outlined in Table 4-1 will be carried out in accordance with the controls specified in the updated WMP, including: during ongoing active ash emplacement; during the carrying out of the MPAR Phase 1 Capping and Drainage and the Zone 2 LBMS and Capping works; and post closure including monitoring and maintenance.

4.1 WANGCOL CREEK REMEDIATION FEASIBILITY STUDY

As required by Condition U1 of EPL 13007, the Wangcol Creek Remediation Feasibility Study, ERM (2026b) assessed potential sustainable and feasible options to be undertaken within or surrounding Wangcol Creek to mitigate potential ongoing impacts by seepage from the MPAR.

Several options were assessed as part of this assessment. In general, these included:

- Backfilling the mined-out features within the Wangcol Creek channel alignment;
- Redirecting the current flow path of Wangcol Creek via pipe or channel infrastructure;
- Augmenting Wangcol Creek streamflow, primarily through increased flows; and
- Constructing wetlands within and/or surrounding Wangcol Creek to assist with the stabilisation and utilisation of pollutant loads in Wangcol Creek.

The Wangcol Creek streamflow augmentation option was identified as the more sustainable and feasible short- to medium term option to improve water quality in Wangcol Creek while the upgraded MPAR capping works authorised by Modification 9 to the Mt Piper Consent (DA80/10060) reduce impacts by seepage from the MPAR over time. The feasibility study concluded that a non-intrusive, low-disturbance, hydrologically-based approach is the most sustainable and feasible option to improve water quality in Wangcol Creek. Wangcol Creek contains sensitive riparian and wetland environments, and it was identified that this option will avoid unnecessary ecological disturbance.

Many of the alternative options considered would require material physical works in the riparian zone and present a wide range of environmental risks associated with such works. The timeframe to implement any options that require physical works in the riparian zone is likely to be constrained by the long lead time to complete the impact assessment and approval process. Further, options such as backfilling the mined-out features or other physical works in the riparian zone are unlikely to materially improve water quality in Wangcol Creek. Augmenting the streamflow with a suitable clean water source will improve water quality in Wangcol Creek in a short timeframe.

Further assessment of the future electrical conductivity target is warranted to better understand surface water-groundwater dynamics along with other factors affecting mixing potential.

The Wangcol Creek Remediation Feasibility Study, ERM (2026b) was provided to the EPA in February 2026, and their feedback has not been received at the time this Capping Strategy was prepared. However, as noted in Section 2.2, separate approvals would be required to authorise any works in Wangcol Creek.

TABLE 4-1 SUMMARY OF MANAGEMENT STRATEGIES BEING IMPLEMENTED

Strategy Item	Overview	Status	Timeline for implementation	Timeline for effect on water quality
Source Controls				
LNAR Mod 1	Amendments to the design and operations of the LNAR (LNAR Mod 1) which authorised installation of a BMS, along with the collection and treatment of leachate moving through the ash placed above the liner.	Approved.	Short-term (implemented from 2021)	Short-term
MPAR Zone 2	Amendments to the design and operation of the MPAR (Mod 9), which authorised installation of a LBMS, as above. (Section 3.3.2).	Approved.	Short-term (implemented from ~2027)	Short-term
MPAR Phase 1 Capping	A low permeability cap over the historical BCA placement areas within the MPAR will reduce the volume, and increase the timing, of infiltration through the MPAR, thus reducing the resulting solute concentrations that would migrate in groundwater beyond the base of the MPAR.	Approved.	Short-term (implemented from ~2025)	Long-term
MPAR Phase 1 Drainage	The improved drainage design further supports recharge control at the MPAR by reducing the residence time of clean runoff and therefore the potential for its infiltration. Reduced infiltration will reduce recharge to the underlying BCA, thereby reducing the rate of leachate production and seepage from previously placed BCA in the MPAR to the underlying groundwater system. The improved drainage arrangements will also increase the volume of clean water flows from the MPAR to Wangcol Creek.	Approved, being implemented.	Short-term (implemented from ~2025)	Long-term
Additional recharge controls for the MPAR batters and benches	Additional recharge controls for the MPAR batters and benches (e.g. improved revegetation) further supports recharge control at the MPAR by increasing the potential for evapotranspiration of water rainwater that falls on the MPAR and therefore the potential for its infiltration. Reduced infiltration will reduce the volume, and increase the timing, of infiltration through the MPAR, thus reducing the resulting solute concentrations that would migrate in groundwater beyond the base of the MPAR.	Approved under existing provisions of the Mt Piper Consent, subject to ongoing assessment.	Short-term (implemented from ~2026)	Long-term
Continued rehabilitation and revegetation improvements	The success of rehabilitation under the interim ground cover strategy (see Section 3.3.3) will be subject to ongoing adaptive management and continuous improvement, through planning, monitoring and evaluation processes.	Approved, being implemented and subject to adaptive management and continuous improvement.	Short-term (ongoing)	Long-term

Per Section 2.3:
- Short-term means within 3 to 5 years
- Medium-term means from 5 years, to within 20-30 year
- Long-term means greater than 30 years.

4.2 OVERVIEW OF ASSESSMENT AND IMPLEMENTATION OF MANAGEMENT AND MITIGATION MEASURES TO DATE

As introduced in Section 1.1.4, the routine monitoring results triggered a contingency investigation associated with the elevated concentrations of key indicator analytes in surface water and groundwater in the vicinity of the MPAR. In accordance with the contingency measures outlined in the Previously Approved WMP, in 2016, ERM was engaged to complete the Independent Groundwater Investigation. This contingency investigation has been a part of program of progressive improvement and adaptive management which has been implemented by EnergyAustralia in relation to the historical placement of BCA in the MPAR as required by the conditions imposed on the Mt Piper Consent (including the Currently Approved WMP and prior versions), and to reflect the outcomes of ongoing engagement with relevant regulators, as further described below and depicted in Figure 4-1.

- In December 2013, the NSW EPA requested further information regarding the increasing concentrations of chloride at groundwater monitoring bore D10; and
- Independent Groundwater Investigation - Initial Data Review (2016-2018).
    - In 2016, in line with the Previously Approved WMP under the conditions of the Mt Piper Consent, ERM was engaged to complete a review of historical data and information related to identified groundwater impacts (i.e. the Independent Groundwater Investigation). The review identified the MPAR as the likely source of increasing chloride concentrations at bore D10; and
    - The outcomes and proposed next steps were presented to NSW EPA in April 2018.
- Independent Groundwater Investigation –Investigation and CSM Update (2018-2020)
    - The findings of the initial data review were subject to further assessment to update the CSM, review and update of the numerical groundwater model (NGM) and to assess management and mitigation options;
    - Field investigations were conducted including drilling, groundwater and surface water investigations undertaken from May 2018 to November 2020 and were completed in addition to the routine monitoring conducted in accordance with the Previously Approved WMP; and
    - Findings from the additional field investigations were used to update the CSM, which was used to inform development of the updated NGM. The findings were also subsequently used to augment the routine water quality monitoring programs conducted in accordance with the Mt Piper Consent (including the Currently Approved WMP), the LNAR Project Approval and EPL 13007, the results of which are each reported separately on an annual basis.

- Independent Groundwater Investigation – NGM Update (2019-2023)
  - The NGM - Approach (ERM, 2019) described the approach for development of a groundwater flow model to assess the leaching of solutes from BCA historically placed within the MPAR, and development of a solute transport model. The NGM - Approach was provided to NSW EPA, WaterNSW and DPHI for comment; and
  - The NGM - Groundwater Flow Model Report (ERM, 2023a) presented the written CSM along with the method by which the groundwater flow model was developed and calibrated to investigate both sub-regional groundwater flow and to quantify groundwater migrating through the Site.
  - The NGM – Solute Transport Model Report (ERM, 2023b) presented the unsaturated vertical leaching model and solute transport model that were developed to investigate the migration of chloride and sulfate from BCA placed in the MPAR to, and within, the underlying regional groundwater flow system, and to assess reasonable and feasible mitigation options for the Site. ERM (2023c) then presented further modelling in support of capping design.
  - The specific objectives for these NGM documents were to:
    - Present the current distribution and assess the potential future distribution of chloride and sulfate in groundwater in the vicinity of the MPAR; and
    - Assess reasonable and feasible management and mitigation options to minimise impacts from the MPAR on groundwater quality and the surface water quality of Wangcol Creek in the vicinity of the MPAR.
  - The outcomes from these NGM documents informed operational changes at the MPAR that have been authorised as part the Mt Piper Consent (Mod 9) (Section 1.1.4).
- Groundwater Interception Project (2020 – 2021)
  - The groundwater interception project proposed the installation and operation of several groundwater interception bores and an in-stream pumping system at Area D within Wangcol Creek. Water transfer and storage infrastructure specific to this project would have included a water transfer pipeline beneath the Castlereagh Highway and additional lined ponds. This project was advanced to the ~80% detailed design stage, however, was subsequently deemed to be unfeasible, as outlined in Section 3.2.1.
- LNAR Mod 1 (2021)
  - EnergyAustralia proposed to strengthen the controls around BCA leachate interception, capture and treatment to minimise the potential vertical and lateral movement of leachate from BCA into the surrounding environment. As outlined in Section 1.1.4, LNAR Mod 1 was authorised in September 2021, providing for improved environmental outcomes from those previously approved for the LNAR.
- Mt Piper Consent Mod 9 (2024-2025)
  - The findings of the Independent Groundwater Investigation have informed operational changes at the MPAR that have been authorised as part of Modification 9 to the Mt Piper Consent (Mod 9). The recharge control at the MPAR (i.e. source control) is the key long-term mitigation option to control groundwater impact related to the MPAR.
- Assessment and Implementation of Additional Recharge Controls (2025-2026)
  - Application of ground cover vegetation on all MPAR batters >946 m AHD was recommended as the most reasonable and feasible additional recharge control option.

- Some level of soil improvement will be required to assist with revegetation efforts on MPAR batters, and the assessment of suitable groundcover species and associated amelioration requirements is ongoing.

- Ongoing Stakeholder Consultation
  - The management strategies and options considered by EnergyAustralia, along with the investigation and assessment outcomes were routinely presented to the NSW EPA, WaterNSW and DPHI progressively throughout the timeline of activities outlined above. These engagements were conducted in addition to the water quality compliance reports that are also provided annually.
  - In addition, EnergyAustralia has routinely provided updates to community stakeholders via the Community Consultative Committee (CCC) via triannual meetings.

With reference to Table 4-1Table 4-, if / when additional mitigation options are identified as being reasonable and feasible for implementation, then an approvals strategy, including engagement with regulatory and community stakeholders, and timelines, will be prepared in line with this Capping Strategy and in line with Section 11 of the updated WMP which will continue to be implemented by EnergyAustralia as part of MPPS operations as required by the Mt Piper Consent.

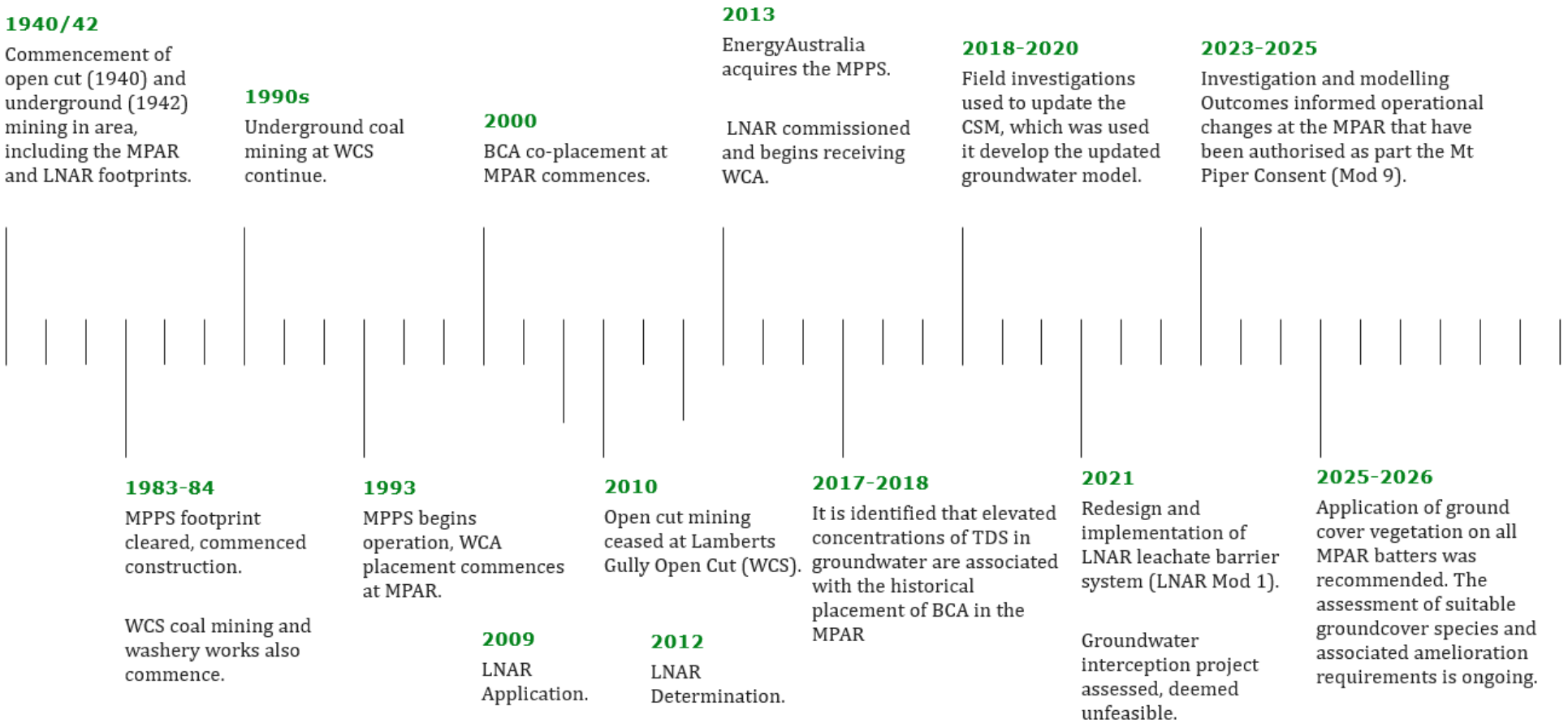


FIGURE 4-1 DEVELOPMENT TIMELINE FOR ASH REPOSITORIES

5. PROCEDURAL CONTROLS

In accordance with Condition 59 of the Mt Piper Consent (Mod 9), this Capping Strategy:

1. Presents the final landform and associated closure related works for the MPAR as currently authorised under the Mt Piper Consent;
2. Presents the short, medium and long-term solutions for control of migration of the solutes from the entire MPAR and into the receiving environment, including consideration of post-closure measures; and
3. Identifies additional works that are required to reduce water infiltration on the batter slopes of the MPAR.

EnergyAustralia has the key role in implementing this Capping Strategy, which must be implemented in parallel to the updated WMP. The updated WMP presents roles and responsibilities for its implementation, while roles and responsibilities that are specific to this Capping Strategy are outlined in Table 5-1.

TABLE 5-1 CAPPING STRATEGY ROLES AND RESPONSIBILITIES

Item	Description
Stakeholders	**Site:** • EnergyAustralia • Contractors working at the MPAR **Community:** • Community Consultative Committee (CCC); and • Springvale Coal Pty Ltd (Springvale). **Regulatory:** • NSW Department of Planning, Housing and Infrastructure (DPHI); • NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW); • NSW Environment Protection Authority (EPA); • WaterNSW; • Natural Resources Access Regulator (NRAR); and • Lithgow City Council (LCC).
Incident Response, TARP and Contingency Plans	In accordance with Appendix E of the updated WMP, EnergyAustralia and Contractors working at the MPAR are responsible for notifying and implementing Environmental Incident Response, Trigger Action and Response Plans and Contingency and Mitigation Measures to maintain surface water and groundwater water quality in response to reported environmental conditions as outlined in Section 11 of the updated WMP.
Communication and Enforceability	In accordance with Appendix E of the updated WMP, EnergyAustralia is required to maintain communication with Site, Community and Regulatory stakeholders regarding all relevant matters addressed by the Capping Strategy and the updated WMP. As a requirement of the Mt Piper Consent, the Capping Strategy and the updated WMP are enforceable under the EP&A Act.
Updates	EnergyAustralia will further review and update the updated WMP to include any measures required to reflect this Capping Strategy within 3 months of this Capping Strategy being approved (Condition 60). EnergyAustralia will then implement the further updated WMP (Condition 43A). Noting that the assessment and implementation of additional mitigation options may be completed progressively, the Capping Strategy and the updated WMP may also need to be updated progressively. Therefore, the Capping Strategy and the updated WMP will be reviewed by EnergyAustralia every 5 years or following any modification to the Mt Piper Consent relating to the MPAR.

6. REFERENCES

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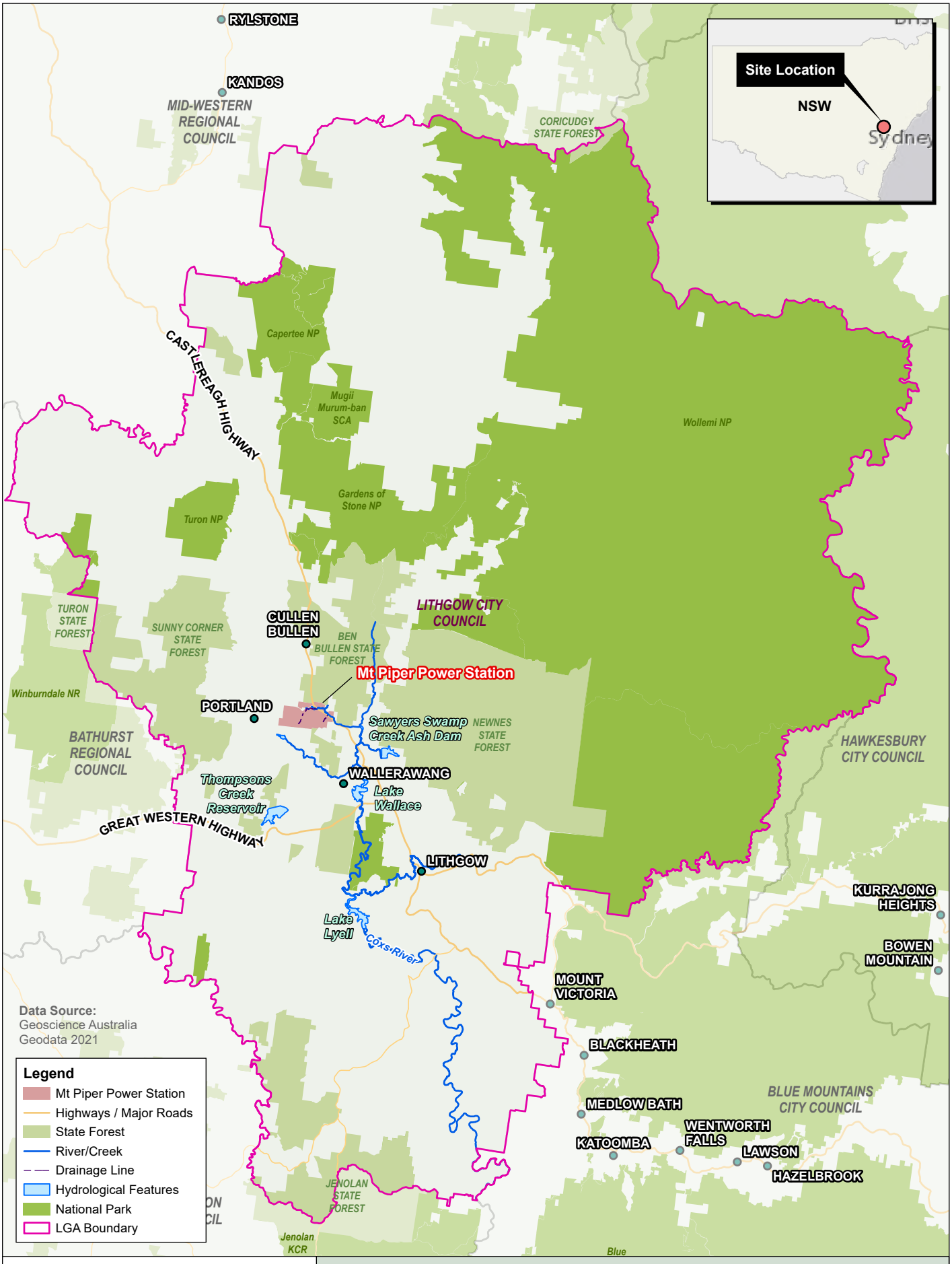
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APPENDIX A FIGURES



Coordinate System:
GDA 1994 MGA Zone 56

Date: 20/11/2025
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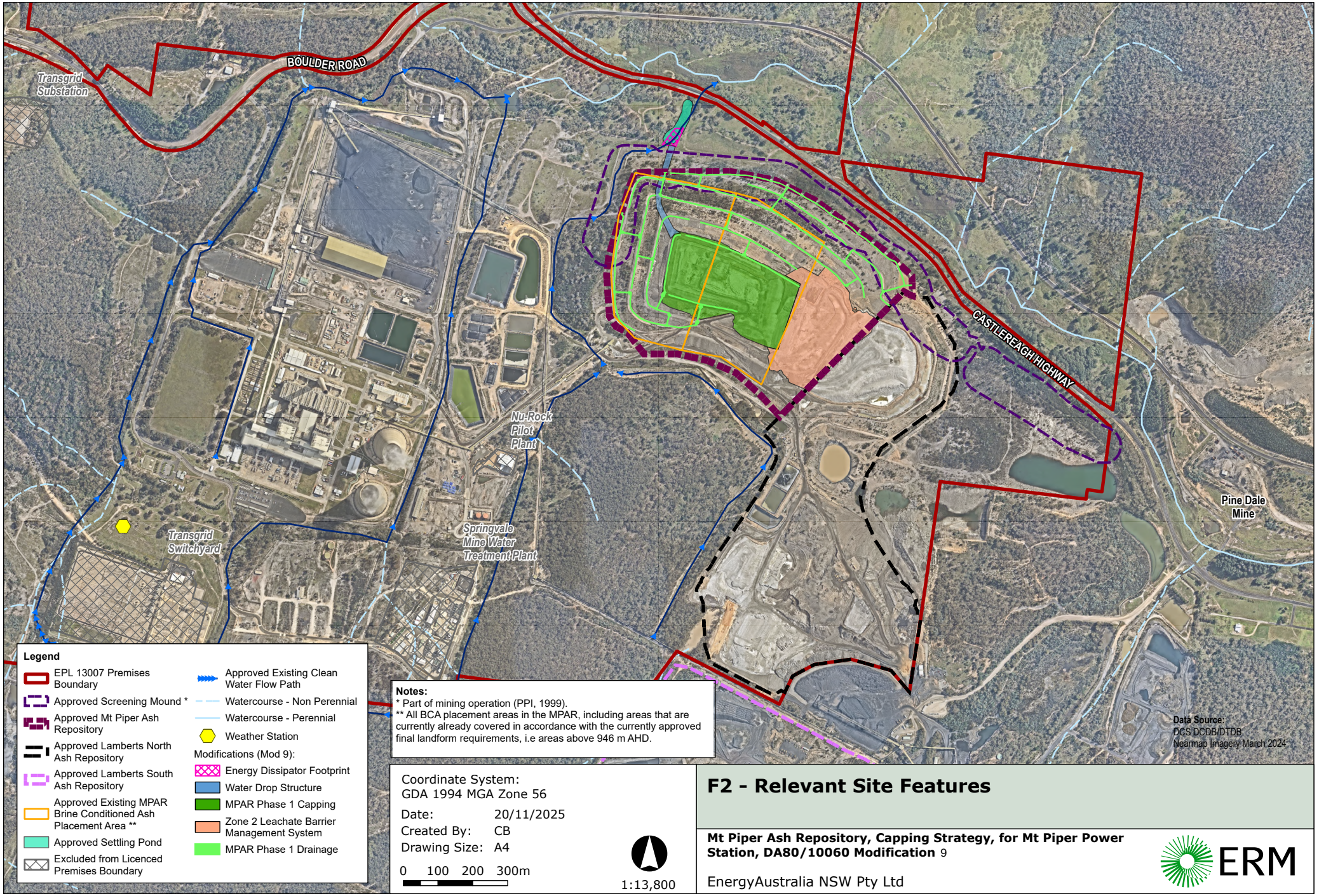
F1 – MPPS Regional Context

Mt Piper Ash Repository, Capping Strategy, for Mt Piper Power Station, DA80/10060 Modification 9

EnergyAustralia NSW Pty Ltd

ERM

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Coordinate System:
GDA 1994 MGA Zone 56

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F2 - Relevant Site Features

Mt Piper Ash Repository, Capping Strategy, for Mt Piper Power Station, DA80/10060 Modification 9

EnergyAustralia NSW Pty Ltd

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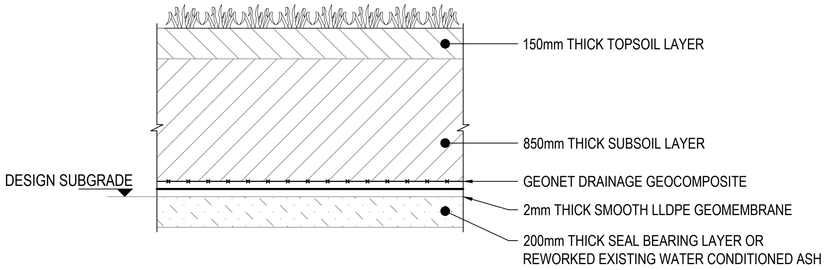
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APPENDIX B STATEMENT OF LIMITATIONS

1. This report is based solely on the scope of work described in our proposal P0807113 dated 25 November 2025 (Scope of Work) and performed by Environmental Resources Management Australia Pty Ltd (ERM) for EnergyAustralia NSW Pty Ltd (the Client). The Scope of Work was governed by a contract between ERM and the Client (Contract).
2. No limitation, qualification or caveat set out below is intended to derogate from the rights and obligations of ERM and the Client under the Contract.
3. The findings of this report are solely based on, and the information provided in this report is strictly limited to that required by, the Scope of Work. Except to the extent stated otherwise, in preparing this report ERM has not considered any question, nor provides any information, beyond that required by the Scope of Work.
4. This report was prepared between 25 November 2025 and 17 April 2026 and is based on conditions encountered and information reviewed at the time of preparation. This report does not, and cannot, take into account changes in law, factual circumstances, applicable regulatory instruments or any other future matter. ERM does not, and will not, provide any on-going advice on the impact of any future matters unless it has agreed with the Client to amend the Scope of Work or has entered into a new engagement to provide a further report.
5. Unless this report expressly states to the contrary, ERM's Scope of Work was limited strictly to identifying typical environmental conditions associated with the subject site(s) and does not evaluate the condition of any structure on the subject site nor any other issues. Although normal standard for professional practice have been applied, the absence of any identified hazardous or toxic materials, or any identified impacted soil or groundwater on the Site(s) should not be interpreted as a guarantee that such materials or impacts do not exist.
6. This report is based on one or more site inspections conducted by ERM personnel, the sampling and analyses described in the report, and information provided by the Client or third parties (including regulatory agencies). All conclusions and recommendations made in the report are the professional opinions of the ERM personnel involved. Whilst normal checking of data accuracy was undertaken, except to the extent expressly set out in this report, ERM;
   a) Did not, nor was able to, make further enquiries to assess the reliability of the information or independently verify information provided by;
   b) Assumes no responsibility or liability for errors in data obtained from, the Client, any third parties or external sources (including regulatory agencies).
7. Although the data has been used in compiling this report is generally based on actual circumstances, if the report refers to hypothetical examples those examples may, or may not, represent actual existing circumstances.

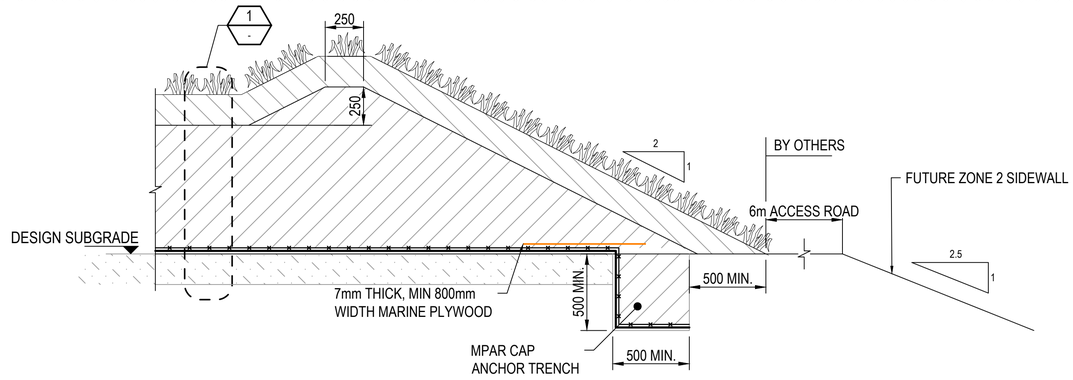
8. Only the environmental conditions and or potential contaminants specifically referred to in this report have been considered. To the extent permitted by law and except as is specifically stated in this report, ERM makes no warranty or representation about:
    a) The suitability of the Site(s) for any purpose or the permissibility of any use;
    b) The presence, absence or otherwise of any environmental conditions or contaminants at the Site(s) or elsewhere; or
    c) The presence, absence or otherwise of asbestos, asbestos containing materials or any hazardous material on the Site(s).
9. Use of the Site for any purpose may require planning and other approvals and, in some cases, environmental regulator and accredited site auditor approvals. ERM offers no opinion as to the likelihood of obtaining any such approvals, or the conditions and obligations which such approvals may impose, which may include the requirement for additional environmental works.
10. The ongoing use of the Site or use of the Site for a different purpose may require the management of or remediation of site conditions, such as contamination and other conditions, including but not limited to conditions referred to in this report.
11. This report should be read in full and no excerpts are to be taken as representative of the whole report. To ensure its contextual integrity, the report is not to be copied, distributed or referred to in part only. No responsibility or liability is accepted by ERM for use of any part of this report in any other context.
12. Except to the extent that ERM has agreed otherwise with the Client in the Scope of Work or the Contract, this report:
    a) Has been prepared and is intended only of the exclusive use of the Client;
    b) Must not to be relied upon or used by any other party;
    c) Has not been prepared nor is intended for the purpose of advertising, sales, promoting or endorsing and Client interests including raising investment capital, recommending investment decisions, or other publicity purposes;
    d) Does not purport to recommend or induce a decision to make (or not make) any purchase, disposal, investment, divestment, financial commitment or otherwise in or in relation to the Site(s); and
    e) Does not purport to provide, nor should be constructed as, legal advice.

APPENDIX C KEY MPAR PHASE 1 CAPPING AND DRAINAGE: IFC DIAGRAMS



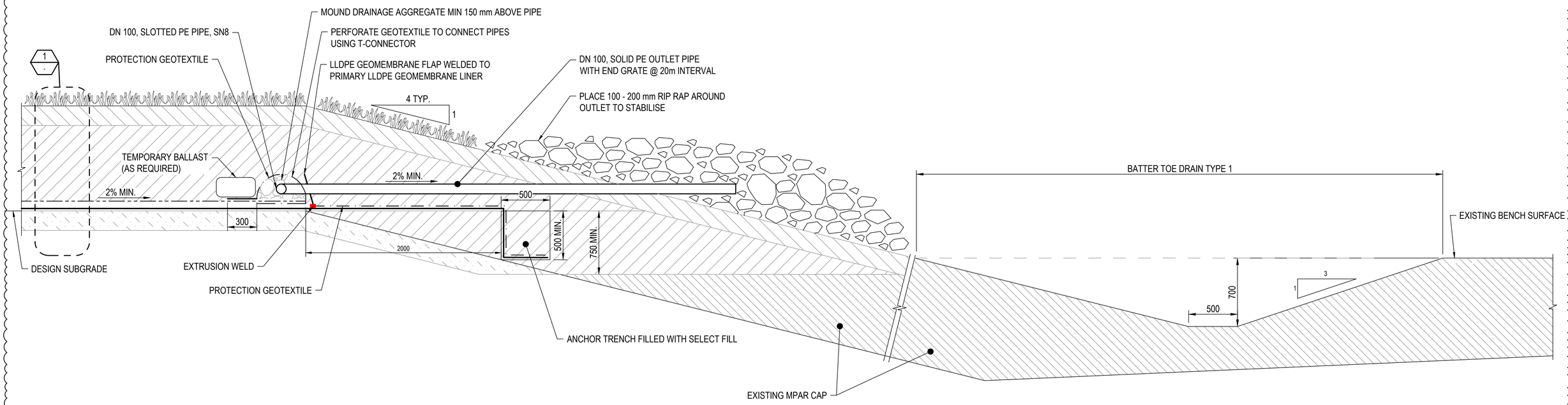
TYPICAL CAPPING SYSTEM PROFILE FOR PLATFORM

1 / C201 DETAIL
SCALE 1 : 20



TERMINATION ALONG ZONE 2 BOUNDARY

3 / C201 DETAIL
SCALE 1 : 20



TYPICAL EDGE DETAIL

2 / C201 DETAIL
SCALE 1 : 20

THIS DRAWING INCLUDES COLOURED INFORMATION
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Rev	Description	Checked	Approved	Date
1	ISSUED FOR CONSTRUCTION	CN	NR	08/08/2025
1	ISSUED FOR TENDER	CN	AR	15/04/2025

Author R. LOPEZ **Drafting Check** A. DE VERA
Designer R. HUYNH **Design Check** A. ROBERTS

0 0.2 0.4 0.6 0.8 1.0m
SCALE 1:20 AT ORIGINAL SIZE

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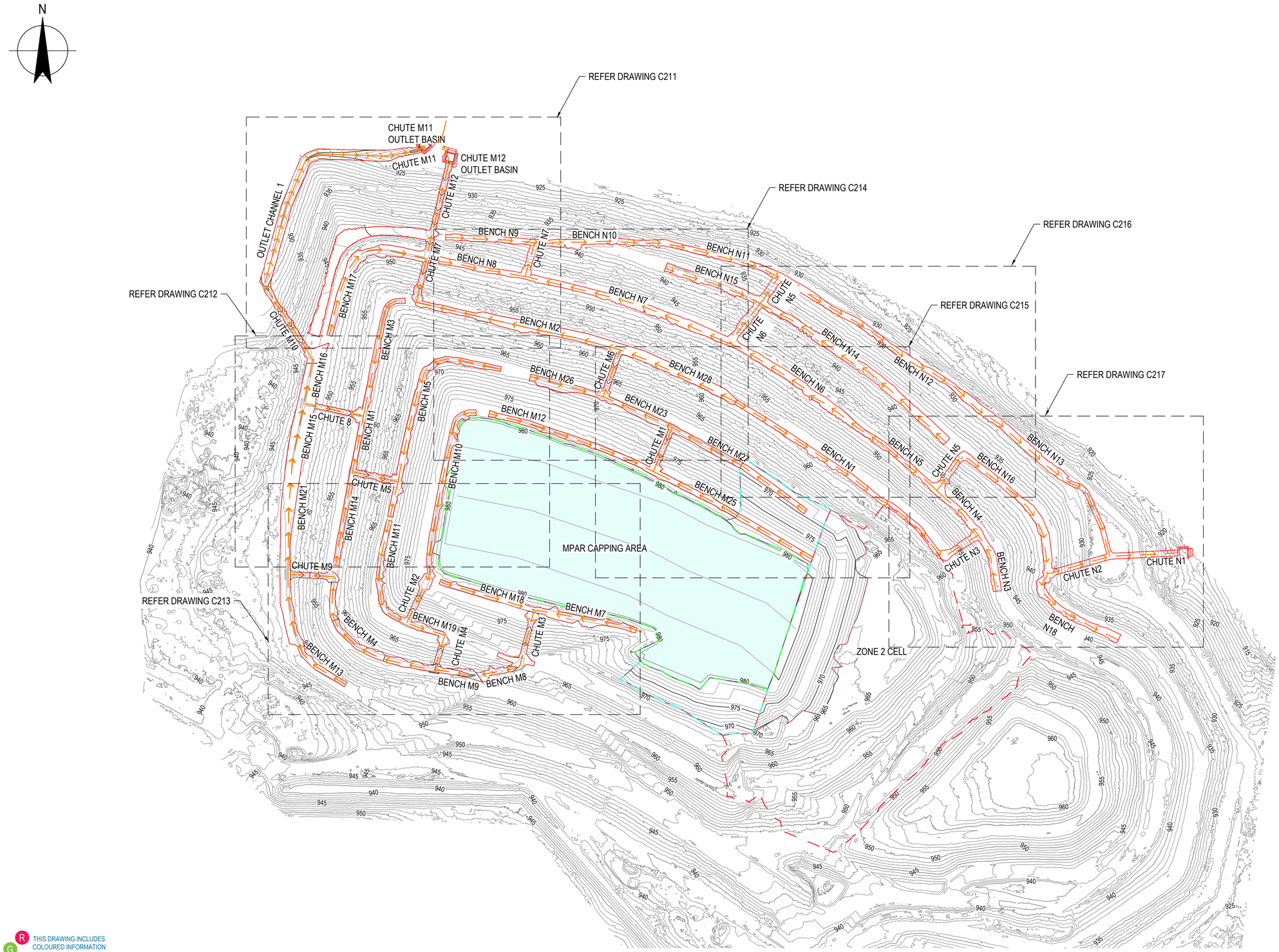
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Project No. 12610307

Client: ENERGYAUSTRALIA NSW PTY LTD
Project: PROJECT HYDRA STREAM 3 DESIGN SERVICES SP2 - MPAR FINAL CAP DESIGN
Status: FOR CONSTRUCTION Status Code: S4

Drawing Title: TYPICAL SECTIONS AND DETAILS SHEET 1 OF 4
Size: A1
Drawing No.: 12610307-C206
Rev: 1

Plot Date: 11 August 2025 - 8:34 AM Plotted by: Riken Joshua Lopez File Name: C:\12d\SW\data\P-00-12D-001\21-12610307 - Mt Piper - Ash Repository_2613\CADD\Drawings\SP2 - MPAR CAP\12610307-C206.dwg



LEGEND:

- EXISTING SITE CONTOURS
- DESIGN CONTOURS (TOP OF CAP)
- MPAR CAP EXTENT
- ZONE 2 EXTENT (FUTURE WORK)
- EXTENT OF DRAINAGE EARTHWORKS DESIGN
- FLOW DIRECTION

NOTES:

1. EXTENTS AND ALIGNMENTS SHOWN ON DRAWING ARE APPROXIMATE.
2. CONTRACTOR TO CONFIRM THE ACTUAL EXTENTS AND ALIGNMENT ON SITE BASED ON CONSTRUCTION MODELS AND TYPICAL DETAILS.
3. CONTRACTOR TO COMPLETE POTHOLING ACROSS EXTENT OF DRAINAGE EARTHWORKS AT 20-50 m CENTRES, WITH A FINAL INVESTIGATION PLAN APPROVED BY THE SUPERINTENDENT PRIOR TO POTHOLING. THE POTHOLING SHALL CONFIRM THE DEPTH AND TYPE OF MATERIAL PRESENT ABOVE PLACED ASH. POTHOLES SHALL BE GEOLOCATED AND THIS INFORMATION PROVIDED AS PART OF THE RESULTS. THE SUPERINTENDENT SHALL LIAISE WITH THE DESIGNER ON THE RESULTS TO CONFIRM EXTENT OF OVEREXCAVATION REQUIRED TO RE-ESTABLISH CAPPING BELOW ANY DRAINAGE INFRASTRUCTURE.

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SURFACE WATER DRAINAGE GENERAL ARRANGEMENT PLAN

SCALE 1:2000

Rev	Description	Checked	Approved	Date
1	ISSUED FOR CONSTRUCTION	CN	NR	08/08/2025
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Author R. LOPEZ **Drafting Check** A. DE VERA
Designer R. VERGER **Design Check** A. ROBERTS

0 20 40 60 80 100m
SCALE 1:2000 AT ORIGINAL SIZE

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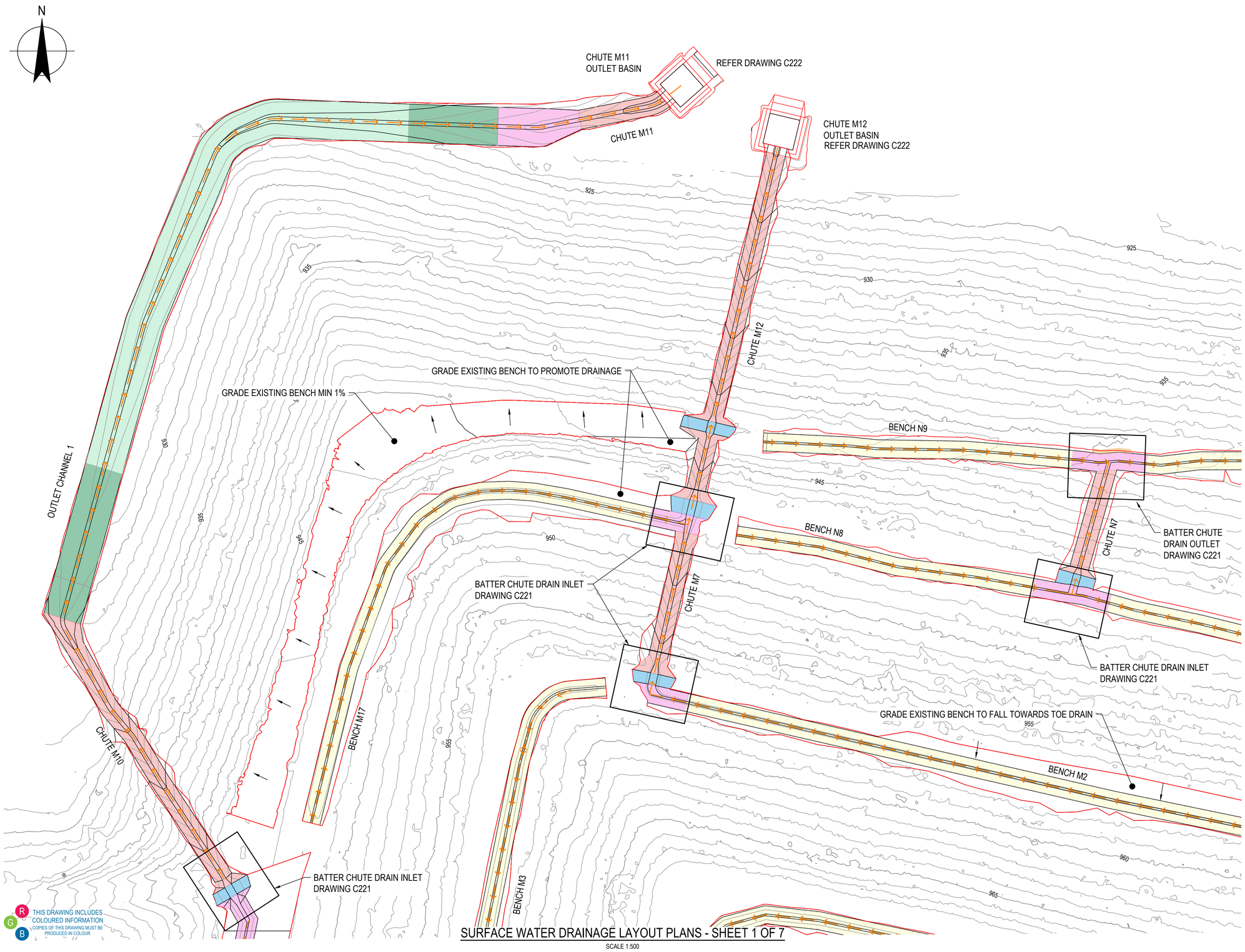
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Project No. 12610307

Client: ENERGYAUSTRALIA NSW PTY LTD
Project: PROJECT HYDRA STREAM 3 DESIGN SERVICES SP2 - MPAR FINAL CAP DESIGN
Status: FOR CONSTRUCTION Status Code: S4

Drawing Title: SURFACE WATER DRAINAGE GENERAL ARRANGEMENT PLAN
Size: A1
Drawing No.: 12610307-C210
Rev: 1

Plot Date: 11 August 2025 - 10:57 AM Plotted by: Riken Joshua Lopez
File Name: C:\12d\SW\data\P-00-12D-001\21-12610307 - Mt Piper - Ash Repository_2613\CADD\Drawings\SP2 - MPAR CAP\12610307-C210.dwg



LEGEND:

- 500 — EXISTING SITE CONTOURS
- 500 — DESIGN CONTOURS
- FLOW DIRECTION
- BATTER CHUTE
- CONCRETE BENCH CROSSING
- ROCK MATTRESS (300 THICK)
- BATTER CHUTE OUTLET ROCK GABION WALL
- BATTER TOE DRAIN - TYPE 1
- OUTLET CHANNEL - TYPE 1
- OUTLET CHANNEL - TYPE 2

NOTES:

1. EXTENTS AND ALIGNMENTS SHOWN ON DRAWING ARE APPROXIMATE.
2. CONTRACTOR TO CONFIRM THE ACTUAL EXTENTS AND ALIGNMENT ON SITE BASED ON PREPARED SITE LEVELS AND TYPICAL DETAILS.
3. MINOR GRADING OF EXISTING BENCHES SHALL BE UNDERTAKEN TO PROMOTE SURFACE WATER DRAINAGE TOWARDS DRAINAGE STRUCTURES AND PREVENT PONDING.

SURFACE WATER DRAINAGE LAYOUT PLANS - SHEET 1 OF 7

SCALE 1:500

Rev	Description	Checked	Approved	Date
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Author R. LOPEZ **Drafting Check** A. DE VERA
Designer R. VERGER **Design Check** A. ROBERTS

0 5 10 15 20 25m
SCALE 1:500 AT ORIGINAL SIZE

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Project No. 12610307

Client ENERGYAUSTRALIA NSW PTY LTD
Project PROJECT HYDRA STREAM 3 DESIGN SERVICES SP2 - MPAR FINAL CAP DESIGN
Status FOR CONSTRUCTION Status Code S4

Drawing Title SURFACE WATER DRAINAGE LAYOUT PLANS - SHEET 1 OF 7
Size A1
Drawing No. 12610307-C211
Rev 1

Plot Date: 11 August 2025 - 10:57 AM Plotted by: Riken Joshua Lopez File Name: C:\12d\SW\data\P-00-12D-001\21-12610307 - Mt Piper - Ash Repository_2613\CADD\Drawings\SP2 - MPAR CAP\12610307-C211-214.dwg

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