9 October 2025

NSW Department of Planning, Housing and Infrastructure
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Modification to Liddell Future Land Use and Enabling Works State Significant Development Consent 24937520 (SSD-24937520) for Ash Dam Toe Drain works – Request for Secretary Environmental Assessment Requirements

1 Introduction

This letter has been prepared by Ramboll Australia Pty Ltd (Ramboll) on behalf of AGL Macquarie Pty Ltd (AGLM), a subsidiary of AGL Energy Pty Ltd (AGL), to support a request for Secretary Environmental Assessment Requirements (SEARs) to modify the State Significant Development (SSD) 24937520 (SSD-24937520) for the Liddell Future Land Use and Enabling Works project (the project) at the former Liddell Power Station (LPS). The proposed modification is to facilitate maintenance and upgrades for the seepage collection and monitoring infrastructure at the Liddell Ash Dam (LAD) toe drain (the modification).

It is expected the modification would be under Section 4.55(1A) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) as a modification involving a minimal environmental impact.

2 Background

The LPS, located near Muswellbrook, New South Wales (NSW), operated from the 1970s until April 2023 and shares infrastructure with the adjoining Bayswater Power Station (BPS) site, collectively forming the AGL Macquarie Complex. In 2014, AGL acquired both LPS and BPS from the NSW Government owned Macquarie Generation, subsequently forming AGLM. The LPS ceased operations in April 2023.

Development consent was required for the demolition of the LPS under the EP&A Act and the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). The project was declared SSD under the EP&A Act and the *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP). An Environmental Impact Statement (EIS) was prepared by GHD Pty Ltd in March 2023. The approval for development consent (SSD-24937520) was provided by the Department of Planning, Housing and Infrastructure (DPHI) on 31 January 2025, with EPBC controlled action approval granted on 7 March 2025 by the Commonwealth Department of Climate Change, Energy, the Environment and Water. Appendix 1 of the development consent for SSD-24937520 identifies the area

within which all project related work must be contained (the 'approved development area'), which is shown in **Figure 1**.

SSD-24937520 allows for works "*to be undertaken prior to and following decommissioning of the LAD to manage surface water surrounding and on the LAD surface and maintain the structural integrity of ash retaining structures*" (page 64 of the EIS) with the ultimate goal being closure and rehabilitation of the LAD. The purpose of the toe drain is to collect and direct water to the v-notch to allow monitoring of seepage volume and flow rate. Additionally, the toe drain improves slope stability and serves as a monitoring point for water quality. Maintenance and upgrades for the existing seepage collection and monitoring infrastructure at the LAD toe drain are needed, with approximately half of the toe drain being outside the approved development area under SSD-24937520.

The LAD is a declared dam under the *Dam Safety Act 2015* and the modification is required to restore full functionality to the seepage monitoring infrastructure. As such, drainage improvement works are required outside of the approved development area to restore LAD seepage infrastructure within an area defined hereafter as the 'modification area'. The modification area is shown in **Figure 1**.

Further, AGLM is seeking administrative changes to SSD-24937520 as described in **Section 3**.

3 Modification description

3.1 Overview

This request to modify SSD-24937520 proposes:

- construction and ongoing use of drainage improvement works at the LAD toe drain (refer to **Section 3.2**)
- amending the approved development area as defined by SSD-24937520 to include the area to be disturbed for the drainage improvement works (the modification area) that are outside the existing approved development area
- amendment to the definition of "preliminary works" included in the development consent for SSD-24937520 (refer to **Section 3.3**)
- amendment to Condition C30(a) of the development consent for SSD-24937520, which currently requires the LAD Closure and Rehabilitation Plan within twelve months of commencing construction (refer to **Section 3.4**)
- add Lot 2 DP 1193252 to the Schedule of Lands in the Conditions of Consent (Appendix 2) (refer to **Section 3.5**).

3.2 Drainage improvement works

The seepage drainage improvement works for the LAD toe drain would include upgrade and maintenance works to support post-closure conditions, the incorporation of automated telemetry monitoring instrumentation and the construction of a grass lined swale.

The general arrangement for the modification is shown in **Figure 1** and preliminary detailed design drawings by Aurecon are included in **Appendix 1**, showing the location of each of the features described in the project activities below. The key modification activities would generally include:

1) maintenance activities for post-closure conditions:
    a) maintenance of the 'swampy area' would include:
        i) the removal of vegetation and trees within the modification area;
        ii) excavation and backfilling with sand material;
        iii) installation of high-density polyethylene (HDPE) corrugated drain pipe;
        iv) placement of sand fill and topsoil cover material; and,

v) grading works to direct surface runoff to the grass lined swale.

b) maintenance of the 'main channel' of the seepage drainage system would include:
   i) the removal and demolition of the existing main channel; installation of subsurface reinforced concrete stormwater pipe along the existing channel alignment; placement of compacted sand and topsoil material over subsurface stormwater pipe; and grading to act as a grass lined channel
   ii) the construction of a stormwater collection pit for connections with the new proposed subsoil drain (within swampy area), the existing surface water collection system (stormwater pit 7) and the new proposed subsurface reinforced stormwater pipe
   iii) new connections for the two existing flow meters housed within the stormwater collection pit with the outlet of the new proposed HDPE corrugated drain pipe (for the measurement of seepage flows) and the existing HDPE stormwater pipe originating from Pit 7 (for the measurement of surface drainage flows)

c) maintenance of the 'northern and southern arm' would include:
   i) the removal and demolition of the existing concrete lined drains and the regrading of the area so that surface runoff is redirected away from the swampy area and into the grass-lined swale

d) maintenance of pits 3 and 7 would include:
   i) installation of a new HDPE stormwater pipe (or similar pipe), connection of the invert of pit 3 and pit 7, and connection into the stormwater collection pit which houses the flowmeters

e) maintenance of the coal conveyer embankment would include:
   i) installation of riprap headwall at the end of the new proposed reinforced concrete stormwater pipe and grass lined swale area to allow for the transition to the coal conveyor embankment

2) incorporation of automated telemetry monitoring instrumentation:
   a) installation of new monitoring instrumentation and the upgrade and/or replacement of existing monitoring installation including:
      i) replacement of 'VN1' with an automated telemetrised flowmeter to monitor seepage from the toe of the dam
      ii) upgrade of 'SP3' with an automated telemeterised flowmeter / V-notch to monitor surface drainage of the right abutment
      iii) Installation of new monitoring points 'LD1' and 'LD2' using new telemetered standpipes piezometer/groundwater wells at the swampy area towards the upstream to determine the standing water level of the underdrainage seepage area

3) construction of a grass lined swale:
   a) a grass lined swale would be erected on top of the new proposed reinforced concrete stormwater pipe. A three metre disturbance buffer area would be applied from the edge of the grass lined swale and toe of the dam for vegetation clearance.

3.3 Amendment of "Preliminary Works"

The timing of the modification is critical to restore full functionality to the seepage monitoring infrastructure and ensure compliance with requirements of the *Dam Safety Act 2015.* Therefore, AGLM is seeking an amendment to the definition of 'preliminary works' included in the development consent for SSD-24937520 to include the modification. The suggested amendment is as follows (changes in bold):

> "*Development activities required for site establishment and temporary services that do not impact native vegetation (excluding native vegetation within garden beds* ***and the seepage drainage improvement works in accordance with Modification 1****), including environmental mitigation*

measures, laydown areas, emergency muster points, mobilisation of plant and personnel, removal of hazardous materials proposed for demolition delineation of assets for retention and dilapidation surveys of adjacent plant and structures to be retained.".

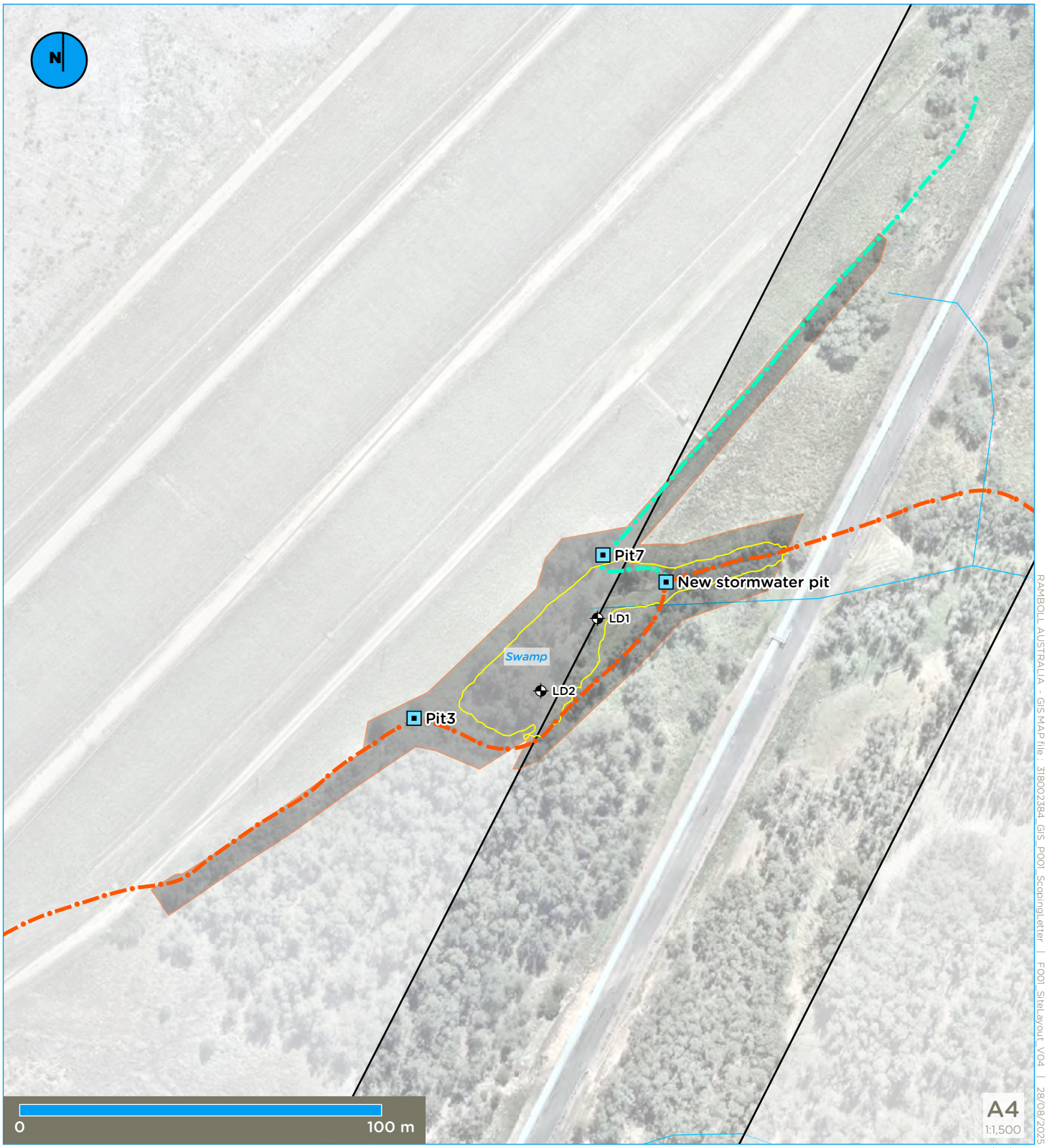
3.4 Timing of LAD Closure and Rehabilitation Plan

Additional requirements for the LAD closure and rehabilitation plan are specified under subsections (b) through to (l) under Part C, Condition 30 of SSD-24937520. AGLM seeks to modify the requirements of this condition to allow for eighteen (18) months (instead of the current twelve (12) months) for the submission of the plan to the Planning Secretary for approval. The aim of this modification is to provide AGLM additional time to complete all the requirements of the plan under SSD-24937520 in sufficient detail. The suggested amendment is as follows (changes in bold):

> *"A closure and rehabilitation plan must be prepared for the Liddell Ash Dam. The plan must:*
> *(a) be submitted to the Planning Secretary for approval within* ***eighteen months*** *of commencing development under this consent;"*.

3.5 Administrative correction to the Schedule of Lands

An administrative modification is requested to add Lot 2 DP 1193252 to the Schedule of Lands in the Conditions of Consent (Appendix 2). This was identified as Property ID 15 in Figure 2.5 of the EIS however was omitted from the Conditions of Consent Appendix 2 Schedule of Lands as discussed with DPHI at the time of project approval.



Aerial photography by Nearmap, flown 20/03/2025

RAMBOLL AUSTRALIA - GIS MAP file - 318002384_GIS_P001_ScopingLetter | F001_SiteLayout_V04 | 28/08/2025

Legend

- Approved development area (SSD-24937520)
- Ash dam toe drain
- Modification area
- Stormwater pit
- Proposed monitoring location
- Surface drain Ash Dam - Northern Arm
- Surface drain Ash Dam - Southern Arm
- Watercourse (NSWSS)

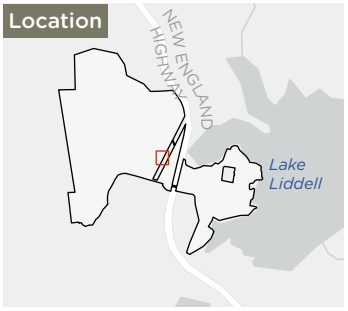


Figure 1 : Site layout

AGL - Liddell Scoping Report and Modification

4 Scoping of environmental impacts

4.1 Issues scoping

A scoping exercise was undertaken by Ramboll to consider the matters requiring further assessment in the modification report as part of this modification letter request. The scoping exercise focused on the drainage improvement works component of the proposed modification. Other requested modifications as outlined in **Section 3** are administrative in nature and do not require further environmental assessment.

Key issues for the drainage improvements works would include:

- biodiversity
- Aboriginal heritage
- soils and contamination
- water and hydrology.

Detail on the proposed methodology for the key issues is included below.

Other minor issues that would be assessed would include:

- air quality (dust)
- noise and vibration
- traffic and access
- waste
- landscape and visual
- cumulative impacts.

4.2 Biodiversity

4.2.1 Existing environment

A Biodiversity Development Assessment Report (BDAR) was prepared to support the original SSD application (Kleinfelder, 2022a) and was subsequently revised (Kleinfelder, 2024) to account for changes to the approved development area that occurred throughout the SSD application process. The vegetation within the approved development area was determined to comprise a combination of remnant woodland, grassland, exotic vegetation and rehabilitated grassland/woodland. A total of five Plant Community Types (PCTs) were identified including:

- PCT 1603 Narrow-leaved Ironbark - Bull Oak - Grey Box shrub - grass open forest of the central and lower Hunter
- PCT 1607: Blakely's Red Gum - Narrow-leaved Ironbark - Rough-barked Apple shrubby woodland of the upper Hunter
- PCT 1604 Narrow-leaved Ironbark - Grey Box - Spotted Gum shrub - grass woodland of the central and lower Hunter
- PCT 1692 Bull Oak grassy woodland of the central Hunter Valley
- PCT 1731 Swamp Oak - Weeping Grass grassy riparian forest of the Hunter Valley

It was predicted that the project would impact a total of 81.11 hectares of native vegetation within the approved development area. The potential for threatened entities was assessed by Kleinfelder (2022; 2024) and it was determined that three Threatened Ecological Communities (TEC) and 11 threatened species were identified to occur within the approved development area.

4.2.2 Preliminary assessment of impacts

A preliminary Flora and Fauna Assessment (FFA) Report was prepared by Kleinfelder (2025) to assess the modification area which included a field survey. The assessment highlighted dense vegetation and overgrown reeds near VN1, which impede downstream flow. Additionally, the report identified that parts of the South Drain are heavily vegetated and that trees with large trunks were observed at the toe of the LAD near stormwater pit 7. Vegetation and reeds downstream of the coal conveyor embankment were noted as requiring clearance.

The modification area is approximately 0.44 hectares located at the base of the LAD. Vegetation clearance would be required within the modification area to facilitate the drainage improvement works. Preliminary findings of the FFA report the modification would impact approximately 0.27 ha of native vegetation and 0.17 ha of exotic grassland, with native vegetation identified as PCT 1731: Swamp Oak – Weeping Grass grassy riparian forest of the Hunter Valley.

Potential impacts to threatened entities were considered in the FFA, which concluded that the modification is unlikely to have a significant impact on threatened species. The key threatened entities potentially at risk of minor impact from the modification were identified as *Delma vescolineata* (Hunter Valley Delma) and the *Diuris tricolor* (Pine Donkey Orchid) species which require further survey and assessment.

4.2.3 Proposed assessment

A biodiversity assessment would be prepared for the modification in accordance with the *Biodiversity Conservation Act 2016* and the Biodiversity Assessment Method (BAM) 2020. The assessment would include:

- updated flora and fauna database searches within a 10 kilometres radius of the modification including, NSW BioNet (Wildlife Atlas) database search for threatened species, populations and migratory species listed under the BC Act and Protected Matters Search Tool for species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- field survey including vegetation mapping and targeted species survey for Hunter Valley Delma and Pine Donkey Orchid
- update vegetation mapping and species polygons based on the identified PCTs
- re-running species and ecosystem credit reports based on those calculations
- assessment of potential impacts and proposed management and mitigation measures
- preparing a biodiversity assessment for the modification.

4.3 Aboriginal heritage

4.3.1 Existing environment

The project is located within the traditional lands of the Wonnarua. An Aboriginal Cultural Heritage Assessment Report (ACHAR) (Kleinfelder, 2022b) was prepared to support the project application which included review of background archaeological information, consultation with Registered Aboriginal Parties (RAPs), an extensive Aboriginal Heritage Information Management System (AHIMS) search and field survey with RAP attendance over multiple days.

Four sites were identified in the ACHAR, however, it was concluded that two of the four sites were unlikely to be impacted by the project and the remaining two sites could be salvaged prior to works commencing to avoid impacts to the known sites.

4.3.2 Preliminary assessment of impacts

A basic AHIMS search was undertaken on 12 August 2025 and included the modification area. No known sites are located within the modification area. One Aboriginal site, previously identified in the project, is in proximity to the proposed works within the approved development area east of the modification area, however, would be avoided as is located approximately 650 metres east of the proposed works, and on the other (eastern) side of the coal conveyor.

While the modification involves earth disturbance, most works are located within already disturbed land in the main channel alignment at the toe of the LAD and the known Aboriginal site would be avoided.

4.3.3 Proposed assessment

An Aboriginal heritage assessment would be prepared for the modification in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (Office of Environment and Heritage, 2011) and the *Aboriginal cultural heritage consultation requirements for proponents* (Department of Environment, Climate Change and Water, Sydney (now Heritage NSW), 2010). The assessment would include:

- updated desktop assessment to identify potentially sensitive areas
- field survey of the proposed disturbance boundary
- assessment of potential impacts and proposed management and mitigation measures
- preparing a revised Aboriginal heritage assessment.

4.4 Soils and contamination

4.4.1 Existing environment

The approved development area and modification area are underlain by the Liddell soil landscape as per the Soil Landscapes of the Singleton 1:250,000 Sheet (Lawrie & Kovac, 1991).The Liddell soil landscape unit is characterised by undulating low hills and undulating hills in the modification area, with elevations ranging from 140 to 220 metres Australian Height Datum and typical slope gradients of four to seven per cent. Key limitations of the Liddell soil landscape include moderate to high erosion hazard, high soil salinity and hard setting. The Liddell soil landscape consists of fine sandy and silty clays with massive structure. Medium clay soils persist throughout the deeper soil horizons.

A baseline contamination assessment report (BCAR) was prepared for the SSD application (Kleinfelder, 2022c). The BCAR recorded exceedances of the identified soil criteria (NEPM 2013) mainly within the key infrastructure areas. Elevated concentrations of metals, petroleum hydrocarbons and Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) and the related group of substances have been detected in soil. The BCAR notes that site-wide metal concentrations are largely considered to be representative of background conditions given the regional setting, which includes intensive mining and agricultural activities.

4.4.2 Preliminary assessment of impacts

The removal of vegetation, in addition to the excavation and backfilling activities, have the potential to temporarily contribute to soil erosion. However, impacts are expected to be localised to the 0.44 hectare modification area within already disturbed land. Further, the installation of HDPE corrugated drain pipe, sand fill, and topsoil cover, coupled with appropriate grading works, aims to stabilise the soil and direct surface runoff effectively into the grass-lined channel.

Based on the elevated concentrations of metals, petroleum hydrocarbons, and PFAS as reported by the BCAR (Kleinfelder, 2022c), the Modification Report would consider potential contamination impacts during construction and maintenance activities.

4.4.3 Proposed assessment

Assessment of the proposed modification activities within the modification area on soils and contamination would be undertaken and included in the Modification Report. The assessment would include:

- review of baseline contamination data and reporting
- assessment of modification activities and their likelihood to cause contamination and their likelihood to disturb existing contaminated material
- assessment of potential impacts and proposed management and mitigation measures
- preparing a soils and contamination assessment.

4.5 Water and hydrology

4.5.1 Existing environment

The project, including the modification area, lie within a broad river valley created by the Hunter River and its tributaries. Whilst the general slope in the area is towards the Hunter River in the south, the topography is characterised by undulating hills that leads to high variability in slope direction across the approved development area.

Surface water features in proximity to the modification area include natural and modified dams and artificial lakes, such as Lake Liddell. Several waterways traverse the approved development area, including Tinkers Creek, which flows into Lake Liddell to the west of LPS. Several unnamed waterways are located to the north of the LAD and flow in an easterly direction into Lake Liddell.

The LAD served as a storage area for ash, whereby during operation ash used to be pumped as a slurry from the LPS for settlement. After the ash has settled, the majority of the decant water from the LAD flowed through a spillway (Skimmer Dam Spillway) to Lake Liddell. The LAD is a 'turkey's nest' dam and therefore receives no significant surface water flows into the dam.

4.5.2 Preliminary assessment of impacts

Potential impacts to water quality for the modification generally concerns the impacts relating to ground disturbance whereby increased turbidity, salinity, nutrient levels, metals or contaminants can be transported into waterways. Further, potential impacts from construction activities such as spills of fuels or chemicals from plant and equipment or litter from construction personnel could pollute local waterways.

Preliminary design investigations undertaken by Aurecon to inform the design drawings provided as **Appendix 1** included a site walkover and a dye test to confirm the existing drainage function of the modification area. It was determined that:

- VN1, installed at the toe of the LAD, is non-functional due to thick vegetation hindering flow
- SP2 measures flow from the diverted open channel, keeping surface runoff away from the swampy area. It is unlikely that SP2 measures seepage from the LAD based on site inspection observations
- flow from SP3 joins the Southern Drain and flows down to pit 3, although the drain was observed to be partly overgrown
- flow from the Northern Drain passes pit 7 and goes through a 'U' bend. Large trees were observed near pit 7

- both pit 3 and pit 7 currently act as sumps, draining to existing open channels downstream as confirmed via dye tests
- wet patches were observed on lower berms along the southern section of the main embankment
- the swampy area at the LAD's toe was observed to be a low point requiring grading to prevent flow stagnation and to divert seepage to Saltwater Creek and Lake Liddell
- the underdrainage from the Stage 2 embankment flows to a collector pipe drain and discharges downstream via pipeline
- the reeds and vegetation downstream of the coal conveyor embankment need clearing to support drainage flow.

The modification aims to improve seepage detection from the LAD and improve the supporting drainage infrastructure. New monitoring points 'LD1' and 'LD2' and replacement and/or upgrades to existing monitoring points 'VN1' and 'SP3' proposed as part of the modification would improve monitoring and data collection efforts to support ongoing management.

Overall, the drainage improvements and installation of automated telemetry monitoring instrumentation would increase the efficiency of existing water management infrastructure, facilitating better monitoring and operational decision-making regarding water seepage and drainage flows and allow for continued monitoring under post-closure conditions.

4.5.3 Proposed assessment

Assessment of the proposed modification activities within the modification area on water and hydrology would be undertaken and included in the Modification Report. The assessment would include:

- assess the site surface water and hydrological conditions based on existing information (including flood mapping and any publicly available water quality data)
- identify the potential impacts on surface water quality, including impacts on adjoining watercourses during construction and operation
- consider how construction would be managed in the event of significant rainfall and flood events
- assessment of potential impacts and proposed management and mitigation measures
- preparing a water and hydrology assessment.

5 Conclusion

We trust the information provided in this letter provides you with sufficient information to provide SEARs for the modification. Please do not hesitate to contact us if there are any further requirements.

Yours sincerely

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Appendices

Appendix 1

Preliminary Detailed Design Drawings

APPENDIX 1
PRELIMINARY DETAILED DESIGN DRAWINGS

525285 - LIDDELL ASH DAM SEEPAGE
TOE DRAIN MODIFICATION

DRAWING INDEX

DRAWING NUMBER	SHEET NAME
525285-W00001-DRG-WM-0001	COVER SHEET AND DRAWING INDEX
525285-W00001-DRG-WM-0002	TECHNICAL SPECIFICATIONS
525285-W00001-DRG-WM-0003	TOE DRAIN MODIFICATION - GENERAL ARRANGEMENT
525285-W00001-DRG-WM-0004	STORMWATER AND SEEPAGE DRAINAGE SYSTEM - LAYOUT
525285-W00001-DRG-WM-0005	STORMWATER AND SEEPAGE DRAINAGE SYSTEM - SECTIONS AND DETAILS
525285-W00001-DRG-WM-0007	TOE DRAIN MODIFICATION EARTHWORKS - PLAN
525285-W00001-DRG-WM-0008	TOE DRAIN MODIFICATION EARTHWORKS - SECTIONS AND DETAILS

LOCALITY PLAN

aurecon

www.aurecongroup.com

ABN: 54 005 139 873

Plot Date: 2025-07-24 2:37 PM Filename: 525285-W00001-DRG-WM-0001.DWG

REV	DATE	REVISION DETAILS	REV	DRAWN	DESIGNED	VERIFIED	APPROVED	SIZE	CONSTRUCTION STATUS	STATUS	CODE	DOCUMENT STATE	DOCUMENT CODE	REFERENCE No.	REV
B	2025-07-24	ISSUED FOR CONSTRUCTION	B	I.M	S.A	R.M	K.S	A1	FOR CONSTRUCTION	CONSTRUCTION	A7	PUBLISHED	525285-W00001-DRG-WM-0001	DRG-WM-0001	B

CIVIL GENERAL NOTES

1. THIS DRAWING SET SHALL BE READ IN CONJUNCTION WITH DESIGN REPORT.
2. PITS, PIPES AND STRUCTURES SHALL BE CONSTRUCTED TO THE LINE, LEVELS AND DIMENSIONS SHOWN ON THE DRAWINGS.
3. DRAINAGE PIPE EXCAVATION AND BACKFILL DESIGN DOES NOT ALLOW FOR VEHICLE TRAFFIC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT CONSTRUCTION PLANT OR OTHER EQUIPMENT LOADS DO NOT OVERSTRESS THE PIPES.

MATERIALS

MATERIAL TYPES DESCRIBED BELOW:

RIP RAP LINING

THIS MATERIAL IS SHALL BE FREE DRAINING AND THE FOLLOWING GRADING LIMITS APPLY:
D50 > 300mm
Dmin = 50mm

ROCK IS TO BE HARD, DENSE, DURABLE, RESISTANT TO WEATHERING AND ANGULAR IN SHAPE, SHALL BE FREE FROM OVERBURDEN SPOIL, SHALE AND ORGANIC MATTER. ROCK THAT IS LAMINATED, FRACTURED, POROUS OR OTHERWISE PHYSICALLY WEAK IS UNACCEPTABLE. AN APPROXIMATE GUIDE TO ROCK SHAPE IS THAT BREADTH OR THICKNESS OF A SINGLE ROCK SHOULD NOT BE LESS THAN ONE THIRD OF ITS LENGTH. ROCK SHOULD HAVE A RELATIVE DENSITY OF 2.6 TO 2.8.

DRAINAGE AGGREGATE

THIS MATERIAL SHALL BE FREE DRAINING, WELL GRADED GRAVEL AND TO BE GRADED BETWEEN 5mm AND 20mm.

SAND FILL

1. THIS MATERIAL SHALL BE A FREE DRAINING, WELL GRADED SAND AND BE GRADED BETWEEN 0.7mm AND 2mm.

2. THE VARIOUS DRAINAGE MATERIALS SHALL:
- COMPRISE OF CLEAN AND DURABLE PARTICLES.
- BE FREE OF ORGANIC MATERIAL AND CLAY LUMPS RETAINED ON A 100mm SIEVE.
- BE SATURATED DURING COMPACTION (FOR GRANULAR MATERIALS CONTAINING LITTLE OR NO FINES).
- HAVE AN AGGREGATE WET STRENGTH NOT LESS THAN 100kN AND THE WET/DRY STRENGTH VARIATION MUST NOT EXCEED 35%.
- BE TESTED IN ACCORDANCE WITH AS 1289.

FOUNDATION PREPARATION

1. DRAIN EXISTING WATER FROM SWAMPY AREA.
2. REMOVE VEGETATION AND EXCAVATE ANY LOOSE OR SOFTENED UNSUITABLE MATERIAL.
3. THE TRENCH FOR THE Ø150 HDPE STORMWATER PIPE VINIDEX STORMPRO OR SIMILAR ADJACENT TO THE TOE OF THE DAM SHOULD BE EXCAVATED IN SECTIONS OF 2m IN LENGTH TO MINIMISE IMPACT TO THE STABILITY OF THE MAIN EMBANKMENT.
4. PLACE SAND IN COMPACTED LAYERS NO MORE THAN 300mm THICK.
5. MATERIAL SHALL BE COMPACTED TO ACHIEVE A MINIMUM OR GREATER THAN 98% MDD (MAXIMUM DRY DENSITY BY STANDARD COMPACTION) IN ACCORDANCE WITH AS 1289 IN THE MIDDLE OF COMPACTED LAYER WITH A MOISTURE CONTENT OF OMC ±2%.
6. ONE PARTICLE SIZE DISTRIBUTION TEST TO CONFIRM MATERIAL GRADING TO BE COMPLETED PER 300mm LAYER.
7. EXCAVATED AREAS SHALL BE KEPT FREE OF WATER AT ALL TIMES BY BAILING AND PUMPING AS NECESSARY, PARTICULARLY PRIOR TO PLACEMENT OF FILL. HIGH GROUND WATER TABLE IS ANTICIPATED ON SITE.

FILL PLACEMENT

1. MATERIAL SHALL BE DUMPED OVER THE PREPARED FOUNDATION OR PREVIOUS LAYER AND SPREAD IN A CONTINUOUS HORIZONTAL LAYER AND COMPACTED TO A THICKNESS NOT EXCEEDING 300mm. THE FILL SHALL BE WATERED AS REQUIRED FOR DUST CONTROL AND MOISTURE CONTENT CORRECTION.
2. NO FILL SHALL BE PLACED ON A SURFACE ON WHICH FREE WATER HAS PONDED.
3. THE MATERIAL WHEN COMPACTED SHALL FORM A SUBSTANTIALLY HOMOGENEOUS MASS WITH UNIFORM MOISTURE, FREE OF LENSES, POCKETS OR LAYERS OF MATERIAL DIFFERING SUBSTANTIALLY IN TEXTURE OR GRADUATION.
4. AT THE END OF EACH DAYS OPERATIONS OR IN THE EVENT OF ADVERSE WEATHER CONDITIONS, THE SURFACE OF THE FILL SHALL BE GRADED TO SHED WATER.
5. RIP RAP PLACEMENT IS TO ACHIEVE INTERLOCKING AND COHESIVE MASS.
6. ALL CHANNELS NOT LINED WITH ROCK OR CONCRETE ARE TO BE GRASS LINED.

Plot Date: 2025-07-24 2:33 PM Filename: 525285-W00001-DRG-WM-0002.DWG

REFERENCE DRAWINGS

REFERENCE MODELS

REV	DATE	REVISION DETAILS	REV	DRAWN	DESIGNED	VERIFIED	APPROVED
A	2025-07-14	ISSUED FOR REVIEW	A	I.M	S.A	R.M	K.S
B	2025-07-24	ISSUED FOR CONSTRUCTION	B	I.M	S.A	R.M	K.S

All written dimensions take precedence over scaled dimensions.

PREPARED BY

aurecon
www.aurecongroup.com

CERTIFICATION	No.	CERTIFIER	DATE

CLIENT

agl

CLIENT DOCUMENT NUMBER	REV

Coordinate system
MGA56 GDA94

Height datum
AHD

PRINT ALL COPIES IN COLOUR

CONSTRUCTION STATUS
FOR CONSTRUCTION

DRAWN BY
I.MCCUBBIN

DESIGNED BY
S.ATHURALIYA

STATUS	CODE
CONSTRUCTION	A7

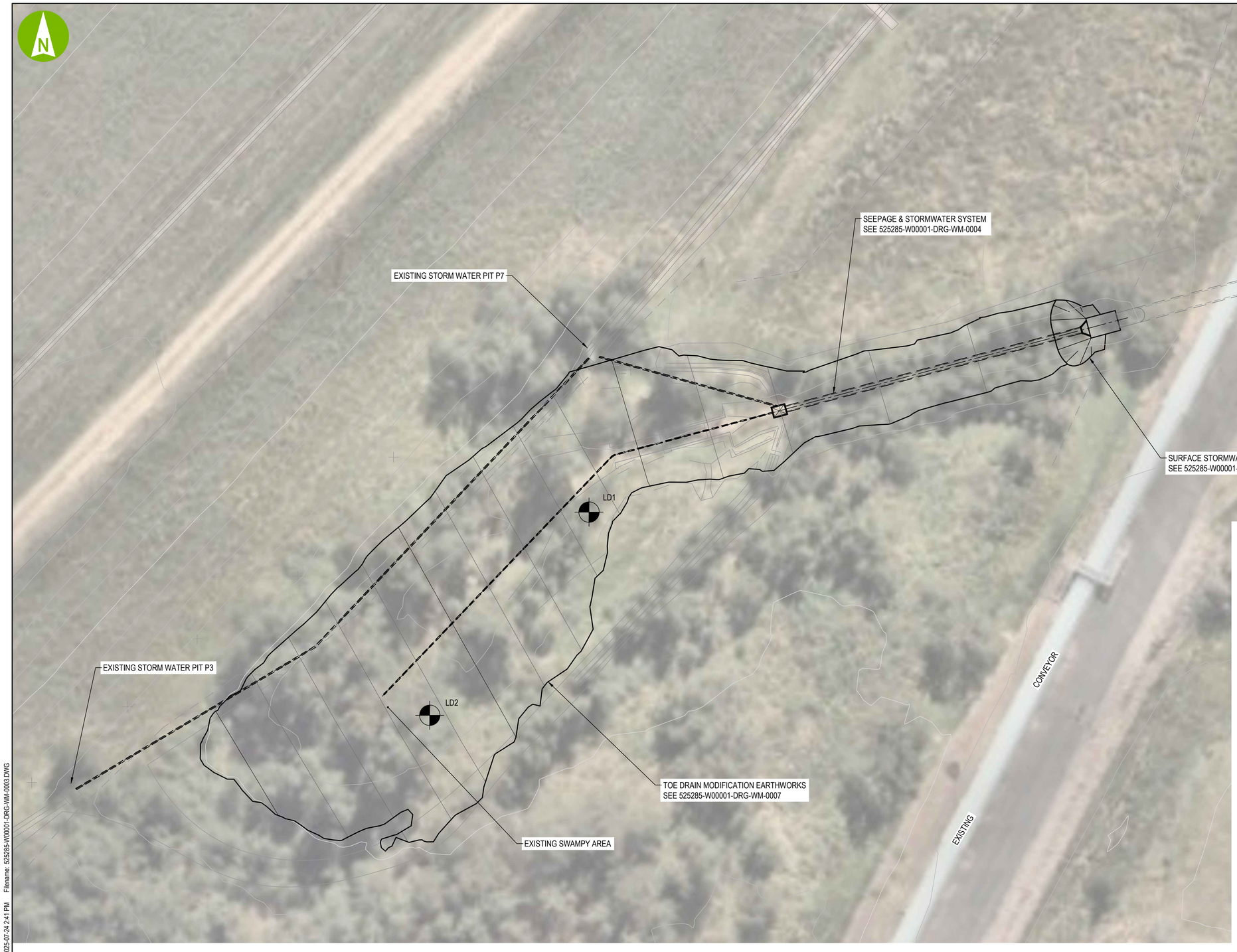
DOCUMENT STATE
PUBLISHED

PROJECT
LIDDELL AD HOC

TITLE
LIDDELL ASH DAM SEEPAGE
TOE DRAIN MODIFICATION
TECHNICAL SPECIFICATIONS

DOCUMENT CODE
525285-W00001-DRG-WM-0002

SCALE	SIZE	REFERENCE No.	REV
NOT TO SCALE	A1	DRG-WM-0002	B



GENERAL ARRANGEMENT
1:200

LEGEND

STANDPIPE PIEZOMETER

KEY PLAN
1:5000

Plot Date: 2025-07-24 2:41 PM Filename: 525285-W00001-DRG-WM-0003.DWG

REFERENCE DRAWINGS

525285-W00001-DRG-WM-0004 TOE DRAIN MODIFICATION - STORMWATER AND SEEPAGE PIPES - PLAN
525285-W00001-DRG-WM-0007 TOE DRAIN MODIFICATION - EARTHWORKS PLAN AND DETAILS

REFERENCE MODELS

REV	DATE	REVISION DETAILS	REV	DRAWN	DESIGNED	VERIFIED	APPROVED
A	2025-07-14	ISSUED FOR REVIEW	A	I.M	S.A	R.M	K.S
B	2025-07-24	ISSUED FOR CONSTRUCTION	B	I.M	S.A	R.M	K.S

1:200 2 0 4 8 m
1:5000 50 0 100 200 m
All written dimensions take precedence over scaled dimensions.

PREPARED BY

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CERTIFICATION	No.	CERTIFIER	DATE

CLIENT

agl

CLIENT DOCUMENT NUMBER	REV

Coordinate system MGA56 GDA94

Height datum AHD

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CONSTRUCTION STATUS
FOR CONSTRUCTION

DRAWN BY
I.MCCUBBIN

DESIGNED BY
S.ATHURALIYA

STATUS	CODE
CONSTRUCTION	A7

DOCUMENT STATE
PUBLISHED

PROJECT
LIDDELL AD HOC

TITLE
LIDDELL ASH DAM SEEPAGE TOE DRAIN MODIFICATION GENERAL ARRANGEMENT

DOCUMENT CODE
525285-W00001-DRG-WM-0003

SCALE	SIZE	REFERENCE No.	REV
AS SHOWN	A1	DRG-WM-0003	B

NOTES

1. EXISTING GROUND TOPOGRAPHY BASED ON LIDAR SURVEY DATED 18 OCTOBER 2021.
2. ALL PIPE JOINTING AND INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
3. PIPE TRENCH SHALL BE EXCAVATED IN LENGTHS OF NO MORE THAN 2m AT ANY ONE TIME. TRENCH TO BE BACKFILLED AND REINSTATED BEFORE PROGRESSING.
4. PIPE TRENCH EXCAVATION DEPTH TO NOT EXCEED 1m BELOW EXISTING SURFACE LEVEL. EXCAVATION INTO EXISTING SURFACE SHOULD BE KEPT AS SHALLOW AS POSSIBLE.

CONNECT Ø150 STORMWATER PIPE TO EXISTING STORMWATER PIT
Ø150 HDPE STORMWATER PIPE VINIDEX STORMPRO OR SIMILAR MAINTAIN MIN 1% FALL SEE NOTES 3 & 4
EXISTING STORMWATER PIT P7
DEMOLISH EXISTING SURFACE DRAIN
INSTALL FLOW METERS ON COLLECTION PIT INLET PIPES SEE DETAIL 1 ON 525285-W00001-DRG-WM-0005
EXISTING Ø1200 DRAINAGE CULVERT PIPE EXACT POSITION & ORIENTATION TO BE CONFIRMED ON SITE
HEADWALL
S.O.P 4
Ø150 HDPE STORMWATER PIPE VINIDEX STORMPRO OR SIMILAR MAINTAIN MIN 1% FALL SEE NOTES 3 & 4
B 0005
F.P
LD1
S.O.P 3
1200 x 900 STORMWATER COLLECTION PIT
Ø450 RC STORMWATER PIPE
DEMOLISH / ABANDON EXISTING DRAINAGE CHANNEL
SURFACE STORMWATER DRAINAGE DEPRESSION SEE 525285-W00001-DRG-WM-0007
TOE DRAIN MODIFICATION EARTHWORKS SEE 525285-W00001-DRG-WM-0007
C 0005
S.O.P 2
CONNECT Ø150 STORMWATER PIPE TO EXISTING STORMWATER PIT
DEMOLISH EXISTING SURFACE DRAIN
F.P
LD2
Ø100 HDPE CORRUGATED AG PIPE
A 0005
S.O.P 1
EXISTING STORMWATER PIT P3

LAYOUT
1:200

LEGEND

STANDPIPE PIEZOMETER - SEE TYPICAL DETAIL ON 525285-W00001-DRG-WM-0005

F.P FLUSHING POINT

STANDPIPE PIEZOMETER LOCATIONS

STANDPIPE No.	EASTING	NORTHING
1	307,948.204	6,416,945.476
2	307,932.543	6,416,925.491

DRAINAGE SYSTEM SET OUT POINTS

S.O.P No.	EASTING	NORTHING	DESCRIPTION
1	307,928.043	6,416,927.543	START SUBSOIL DRAIN
2	307,950.566	6,416,951.059	SUBSOIL DRAIN IP
3	307,966.921	6,416,955.430	STORMWATER COLLECTION PIT
4	307,996.601	6,416,963.363	END Ø450 RC PIPE, HEADWALL CONNECITON

Plot Date: 2025-07-24 2:43 PM Filename: 525285-W00001-DRG-WM-0004.DWG

REFERENCE DRAWINGS

525285-W00001-DRG-WM-0005 STORMWATER & SEEPAGE DRAINAGE SYSTEM - SECTIONS & DETAILS
TOE DRAIN MODIFICATION EARTHWORKS - PLAN

REFERENCE MODELS

REV	DATE	REVISION DETAILS	REV	DRAWN	DESIGNED	VERIFIED	APPROVED
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1:200 2 0 4 8 m

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Height datum AHD

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CONSTRUCTION STATUS

FOR CONSTRUCTION

DRAWN BY I.MCCUBBIN

DESIGNED BY S.ATHURALIYA

STATUS	CODE
CONSTRUCTION	A7

DOCUMENT STATE PUBLISHED

PROJECT

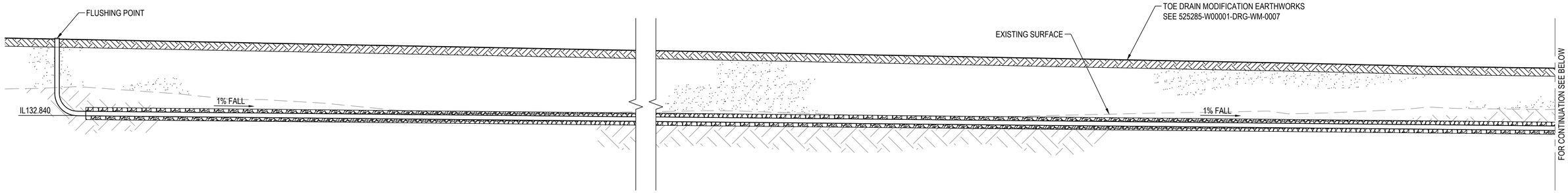
LIDDELL AD HOC

TITLE

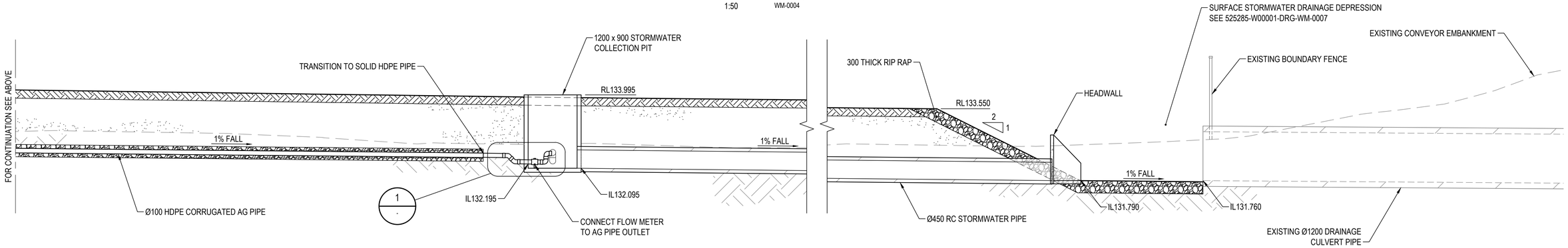
LIDDELL ASH DAM SEEPAGE STORMWATER AND SEEPAGE DRAINAGE SYSTEM LAYOUT

DOCUMENT CODE 525285-W00001-DRG-WM-0004

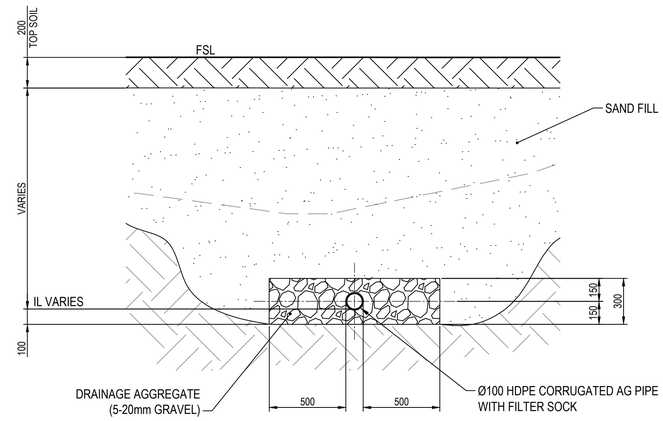
SCALE	SIZE	REFERENCE No.	REV
1:200	A1	DRG-WM-0004	B



SECTION A
1:50 WM-0004

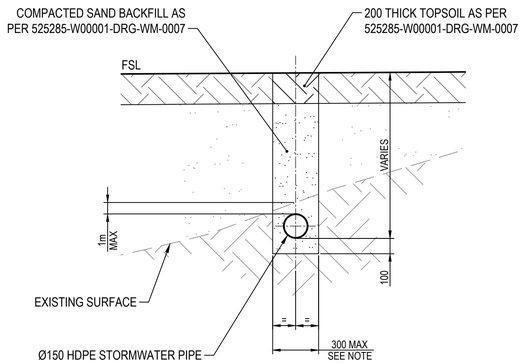


SECTION A
1:50 WM-0004



SECTION B
1:20 WM-0004

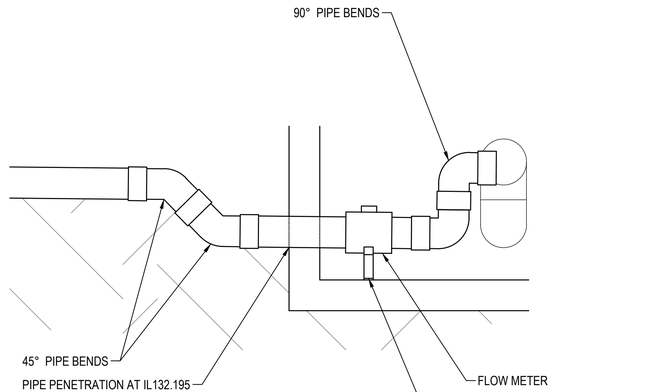
SUBSOIL DRAIN TYPICAL SECTION



NOTE: TRENCH WIDTH TO BE AS NARROW AS POSSIBLE TO MINIMISE IMPACT ON DAM STABILITY

SECTION C
1:20 WM-0004

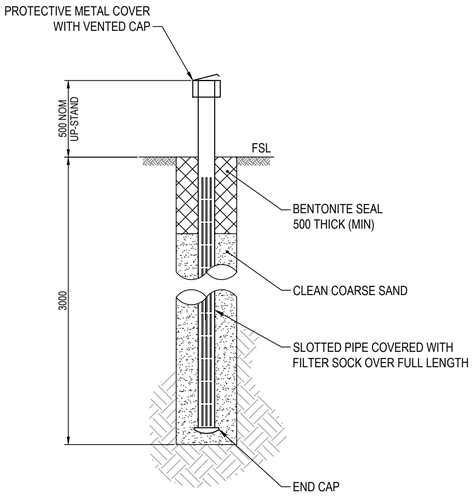
Ø150 HDPE STORMWATER PIPE TRENCH TYPICAL SECTION



NOTE: ARRANGE 90° & 45° BENDS TO CREATE WATER TRAP TO ENSURE CORRECT FLOW METER FUNCTION AS DIRECTED ON SITE

DETAIL 1
1:10 -

PIPE OUTLET FLOW METER ARRANGEMENT TYPICAL DETAIL



STANDPIPE PIEZOMETER TYPICAL DETAIL
1:20

Plot Date: 2025-07-24 2:42 PM Filename: 525285-W00001-DRG-WM-0005.DWG

REFERENCE DRAWINGS

525285-W00001-DRG-WM-0004 STORMWATER & SEEPAGE DRAINAGE SYSTEM - LAYOUT
525285-W00001-DRG-WM-0007 TOE DRAIN MODIFICATION EARTHWORKS - PLAN

REFERENCE MODELS

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1:10 100 0 200 400 mm
1:20 200 0 400 800 mm
1:50 500 0 1000 2000 mm
All written dimensions take precedence over scaled dimensions.

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CERTIFICATION	No.	CERTIFIER	DATE

CLIENT DOCUMENT NUMBER | REV

Coordinate system MGA56 GDA94
Height datum AHD
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CONSTRUCTION STATUS
FOR CONSTRUCTION

DRAWN BY I.MCCUBBIN
DESIGNED BY S.ATHURALIYA
STATUS CONSTRUCTION | **CODE** A7
DOCUMENT STATE PUBLISHED

PROJECT
LIDDELL AD HOC

TITLE
LIDDELL ASH DAM SEEPAGE STORMWATER AND SEEPAGE DRAINAGE SYSTEM SECTIONS AND DETAILS

DOCUMENT CODE
525285-W00001-DRG-WM-0005

SCALE	SIZE	REFERENCE No.	REV
AS SHOWN	A1	DRG-WM-0005	B

PLAN
1:200

EARTHWORKS VOLUMES

TOP SOIL FILL = 260m³

COMPACTED SAND FILL = 825m³

Plot Date: 2025-07-24 2:42 PM Filename: 525285-W00001-DRG-WM-0007.DWG

REFERENCE DRAWINGS

525285-W00001-DRG-WM-0004 STORMWATER & SEEPAGE DRAINAGE SYSTEM - PLAN
525285-W00001-DRG-WM-0008 TOE DRAIN MODIFICATION EARTHWORKS - SECTIONS & DETAILS

REFERENCE MODELS

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1:200 2 0 4 8 m

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PROJECT
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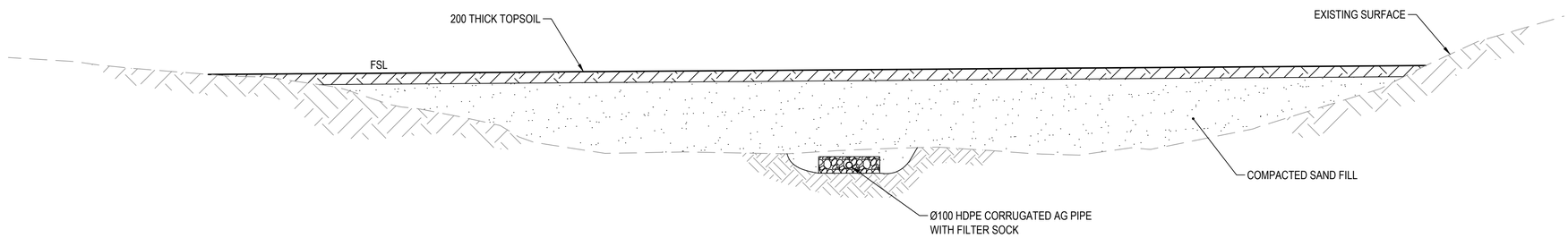
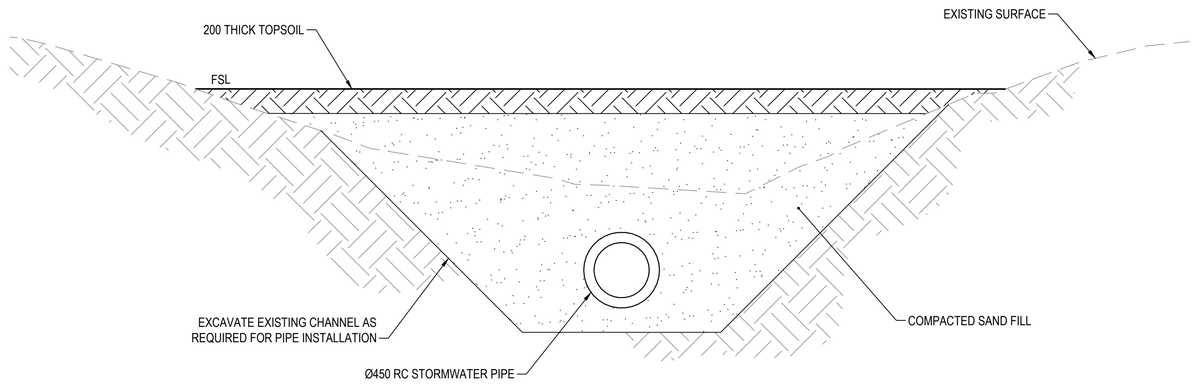
TITLE
LIDDELL ASH DAM SEEPAGE
TOE DRAIN MODIFICATION EARTHWORKS
PLAN

DOCUMENT CODE
525285-W00001-DRG-WM-0007

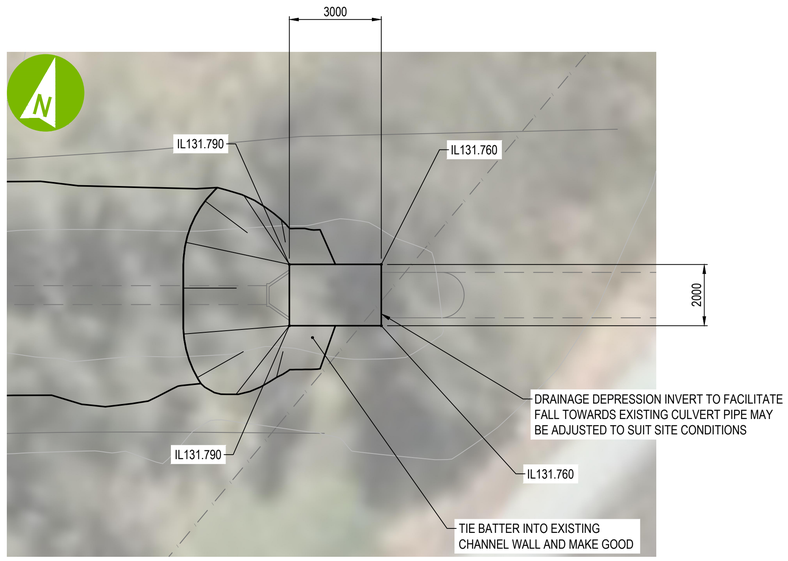
SCALE	SIZE	REFERENCE No.	REV
1:200	A1	DRG-WM-0007	B



SECTION D
1:50 WM-0007



SECTION E
1:25 WM-0007



SURFACE STORMWATER DRAINAGE DEPRESSION DETAIL
1:100

Plot Date: 2025-07-24 2:42 PM Filename: 525285-W00001-DRG-WM-0008.DWG

REFERENCE DRAWINGS

525285-W00001-DRG-WM-0007 TOE DRAIN MODIFICATION EARTHWORKS PLAN

REFERENCE MODELS

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B	2025-07-24	ISSUED FOR CONSTRUCTION	B	I.M	S.A	R.M	K.S

1:25 250 0 500 1000 mm
1:50 500 0 1000 2000 mm
1:100 1 0 2 4 m
All written dimensions take precedence over scaled dimensions.

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PROJECT
LIDDELL AD HOC

TITLE
LIDDELL ASH DAM SEEPAGE
TOE DRAIN MODIFICATION EARTHWORKS
SECTIONS AND DETAILS

DOCUMENT CODE
525285-W00001-DRG-WM-0008

SCALE	SIZE	REFERENCE No.	REV
AS SHOWN	A1	DRG-WM-0008	B