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**Hydro Aluminium Kurri Kurri Pty Ltd**

Document type

**Statement of Environmental Effects**

Date

**June, 2021**

# **STATEMENT OF ENVIRONMENTAL EFFECTS**

## **MODIFICATION 1 TO SSD 6666 – TEMPORARY WATER TREATMENT SYSTEM**

## **STATEMENT OF ENVIRONMENTAL EFFECTS MODIFICATION 1 TO SSD 6666 – TEMPORARY WATER TREATMENT SYSTEM**

Project name **Modification 1 to SSD 6666 – Temporary Water Treatment System**  
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Recipient **Hydro Aluminium Kurri Kurri Pty Ltd**  
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Checked by **Shaun Taylor**  
Approved by **Fiona Robinson**  
Description **Modification to SSD 6666 for the construction and operation of an onsite  
Temporary Water Treatment Plant and associated infrastructure.**

## EXECUTIVE SUMMARY

Hydro Aluminium Kurri Kurri Pty Ltd (Hydro) owns and operates the former Hydro Kurri Kurri Aluminium Smelter (the Smelter) located at Hart Road Loxford, New South Wales (NSW) within the Cessnock City Council local government area.

State Significant Development (SSD) 6666 development consent was issued under Part 4 of the *Environmental Planning and Assessment Act 1979* on 23 December 2020 for remediation of the Smelter (the Project). The SSD 6666 approval includes the management of leachate at the Smelter via an offsite method (pumping leachate from the collection sump by a licensed liquid waste contractor for treatment at a licensed facility) with the option for an onsite Temporary Water Treatment Plant.

Since the issue of the development consent for SSD 6666, Hydro has undertaken further review of the environmental and economic factors associated with onsite versus offsite treatment methods of leachate and has determined that onsite treatment is preferred. A modification to the development consent for SSD 6666 is therefore required to enable the construction and operation of an onsite Temporary Water Treatment Plant and associated infrastructure, collectively called the Temporary Water Treatment System, and to enable discharge of the treated leachate to the existing water management system (the Modification).

The Modification is generally comprised of the following activities:

- Construction of an onsite Temporary Water Treatment System comprised of:
  - Onsite Temporary Water Treatment Plant
  - One megalitre (1 ML) leachate storage dam near the Capped Waste Stockpile
  - 1 ML leachate storage dam near the Containment Cell
  - Associated pipelines and infrastructure
- Construction of a pipeline from the Containment Cell leachate storage dam to the Temporary Water Treatment Plant
- Operation and ongoing maintenance of the Temporary Water Treatment System
- Discharge of treated leachate to the existing Smelter water management system
- Decommissioning of the Temporary Water Treatment System.

This Statement of Environmental Effects has been prepared by Ramboll Australia Pty Ltd on behalf of Hydro to support the modification to the development consent for SSD 6666 under section 4.55(1A) of the *Environmental Planning and Assessment Act 1979*. This Statement of Environmental Effects considers the potential environmental impacts of the Modification and the appropriate management and mitigation measures required.

To determine the potential environmental impacts of the Modification, an assessment was undertaken in relation to soils and water, hazards and risks, air quality and odour, noise and vibration, transport and access, visual, waste, biodiversity and heritage. The impact assessments undertaken for these environmental issues have confirmed that the potential impacts of the Modification will generally be consistent with, or an improvement to, to those of the currently approved Project.

## GLOSSARY OF TERMS

Anode Waste Pile	Polycyclic aromatic hydrocarbon contamination in surface soils to 0.2 meters below ground surface
Clay Borrow Pit	Historically used to source clay used for capping
Containment Cell Leachate Pond	The leachate storage dam located near the Containment Cell approved under SSD 6666 but not yet constructed
Council	Cessnock City Council
Crushing Plant	The concrete and brick crushing plant
Leachate Holding Pond	The proposed leachate storage dam located near the capped waste stockpile
Hydro	Hydro Aluminium Kurri Kurri Pty Ltd
Hydro Land	Approximately 2,000 hectares of buffer zone land surrounding the Site owned by Hydro
Irrigation Area	Area of land used to discharge clean water from the Smelter's water management system located on part Lot 1, Deposited Plan 543057
Leachate	Contaminated liquid generated from water percolating through contaminated matter/materials
Leachate storage dam	A controlled storage area used to contain leachate
North East Dam	The eastern of the two dams located immediately north of the Site used as part of the water collection and treatment system for the Smelter. Water from the North East Dam discharges to the irrigation area in accordance with the EPL.
Stage 1 Demolition	Activities approved under Cessnock City Council approval DA 8/2015/399/1 as described in <b>Table 1-1</b>
Stage 2 Demolition	Activities approved under Cessnock City Council approval DA 8/2018/46 as described in <b>Table 1-1</b>
Temporary Water Treatment Plant	The onsite plant facility used to treat leachate
Temporary Water Treatment System	The Temporary Water Treatment Plant and associated infrastructure including leachate storage dams, leachate storage basin, transfer pipeline and clean water discharge point
The EIS	<i>Environmental Impact Statement Former Hydro Aluminium Kurri Kurri Smelter Demolition and Remediation</i> (Ramboll 2016)
The EPL	Environmental Protection Licence No. 1548
The Modification	The proposed modification to the Smelter comprising the construction and operation of an onsite Temporary Water Treatment Plant and associated infrastructure as described in this Statement of Environmental Effects
The Project	The remediation and demolition activities approved under development consent SSD 6666

The RtS	<i>Response to Submissions Report Former Hydro Aluminium Kurri Kurri Smelter Remediation</i> (Ramboll 2019)
The Site	The area containing the Smelter. It is located on Parts of Lot 3 of Deposited Plan (DP) 456769, Lot 16 DP1082775 Pt 1, Lot 318 DP755231, Lot 319 DP755231, Lot 411 DP755231, Lot412 DP755231, Lot 413 DP755231, Lot 414 DP755231, Lot 420 DP755231, Lot 769 DP755231, Lot 1 DP456769 and Lot 2 DP456769, Hart Road Loxford
The Smelter	The former Hydro Aluminium Kurri Kurri Pty Ltd aluminium smelter at Hart Road, Loxford

## ACRONYMS AND ABRIEVIATIONS

AEP	Annual Exceedance Probability
AGL	Above ground level
AHD	Australian Height Datum
AHIP	Aboriginal Heritage Impact Permit
AS	Australian Standard
AWS	Automatic Weather Station
BC Act	<i>Biodiversity Conservation Act 2016</i>
BOM	Bureau of Meteorology
CCO	Chemical Control Order
CEMP	Construction Environmental Management Plan
Cessnock DCP	<i>Cessnock Development Control Plan 2010</i>
Cessnock LEP	<i>Cessnock Local Environmental Plan 2011</i>
CLM Act	<i>Contaminated Land Management Act 1997</i>
CWS	Capped Waste Stockpile
DA	Development Application
DAF	Dissolved Air Flocculation
DCP	Development Control Plan
EHC Act	<i>Environmentally Hazardous Chemicals Act 1985</i>
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPL	Environment Protection Licence
GAC	Granular Activated Carbon
ha	Hectare
HDPE	High-density polyethylene
Heritage Act	<i>Heritage Act 1977</i>
ICNG	<i>Interim Construction Noise Guideline</i> (Department of Environment and Climate Change 2009)
ITPs	Inspection Test Plans
ITRs	Inspection Test Reports
kL	Kilo litre
km	Kilometre

L	Litre
LGA	Local Government Area
m	Meter
ML	Mega litre
mm	Millimetre
MNES	Matters of National Environmental Significance
MSDS	Material Safety Data Sheet
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measure
NP&W Act	<i>National Parks and Wildlife Act 1974</i>
NSW	New South Wales
PAH	Polycyclic aromatic hydrocarbon
PCB	Pulver Cooper and Blackley
PHA	Preliminary Hazards Analysis
PLC	Programmable logic controller
PMF	Probable Maximum Flood
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
POEO Regulation	<i>Protection of the Environment Operations (Waste) Regulation 2014</i>
Roads Act	<i>Roads Act 1993</i>
RtS	Response to Submissions
SEE	Statement of Environmental Effects
SEPP	State Environmental Planning Policy
SEPP 33	<i>State Environmental Planning Policy No 33 - Hazardous and Offensive Development</i>
SEPP 55	<i>State Environmental Planning Policy No 55 – Remediation of Land</i>
SEPP Infrastructure	<i>State Environmental Planning Policy (Infrastructure) 2007</i>
SEPP Koala Habitat	<i>State Environmental Planning Policy (Koala Habitat Protection) 2019</i>
SEPP S&RD	<i>State Environmental Planning Policy (State and Regional Development) 2011</i>
SSD	State Significant Development
TWTP	Temporary Water Treatment Plant
TWTS	Temporary Water Treatment System
VOCs	Volatile organic compounds
WARR Act	<i>Waste Avoidance and Resource Recovery Act 2001</i>
WM Act	<i>Water Management Act 2000</i>
WSP	Water Sharing Plan

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Leachate Management Plan

### **Appendix 2**

Leachate Storage Ponds Design

### **Appendix 3**

Temporary Water Treatment Plant Design

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Copies of correspondence with agencies

# 1. BACKGROUND

## 1.1 Introduction

Hydro Aluminium Kurri Kurri Pty Ltd (Hydro) owns and operates the former Hydro Kurri Kurri Aluminium Smelter (the Smelter) located at Hart Road Loxford, New South Wales (NSW) within the Cessnock City Council (Council) local government area (LGA) (the Site).

The Site locality is shown on **Figure 1-1**. The Site is approximately 80 hectares (ha) and is surrounded by approximately 2,000 ha of buffer zone land that is also owned and managed by Hydro, referred to as the Hydro Land.

Hydro holds development consent State Significant Development (SSD) 6666 issued under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 23 December 2020 for remediation of the Smelter. SSD 6666 is supported by *Environmental Impact Statement Former Hydro Aluminium Kurri Kurri Smelter Demolition and Remediation* (Ramboll 2016) (the EIS) and *Response to Submissions Report Former Hydro Aluminium Kurri Kurri Smelter Remediation* (Ramboll 2020) (the RtS). The activities approved under the development consent for SSD 6666 are referred to as the Project.

Hydro also holds an Environmental Protection Licence (EPL) for the Smelter administered by the Environmental Protection Authority under the *Protection of the Environment Operations Act 1997* (POEO Act) (EPL No. 1548). EPL 1548 applies to chemical storage and waste generation activities at the Site.

During past operations at the Smelter, mixed waste materials were stockpiled in the eastern portion of the Site, referred to as the Capped Waste Stockpile (CWS). The development consent for SSD 6666 approves the removal and placement of these materials within a Containment Cell, located in the north-western portion of the Site. Past exposure of these waste materials to surface water and groundwater has resulted in the generation of leachate characterised by elevated fluoride, cyanide and sodium concentrations and a high pH. Additionally, any rain that falls within the opened CWS during material removal and within the Containment Cell would be managed as leachate.

The development consent for SSD 6666 includes the management of leachate at the Smelter via an offsite method (by pumping leachate from the collection sump by a licensed liquid waste contractor for treatment at a licensed facility) with the option for an onsite Temporary Water Treatment Plant (TWTP). The RtS states: "*In the event that Hydro decides to proceed with construction and operation of an onsite leachate treatment plant, Hydro would submit a detailed design for review and approval by the Department and the EPA.*" (Ramboll 2020 p.144).

Since preparation of the RtS, Hydro has undertaken further review of the environmental and economic factors associated with onsite versus offsite treatment methods of leachate and has determined that onsite treatment is preferred. A modification to the development consent for SSD 6666 is therefore required to enable the construction and operation of an onsite TWTP and associated infrastructure, collectively called the Temporary Water Treatment System (TWTS), and to enable discharge of the treated leachate to the existing Smelter water management system (the Modification).

## 1.2 Document Purpose

This Statement of Environmental Effects (SEE) has been prepared by Ramboll Australia Pty Ltd (Ramboll) on behalf of Hydro to support a modification to the development consent for SSD 6666 under section 4.55(1A) of the EP&A Act.

This SEE has been prepared in accordance with the Department of Planning, Industry and Environment *Modifying an Approved Project Draft Environmental Impact Assessment Guidance Series* (June 2017) and considers the following matters:

- The environmental impacts of the Modification
- The appropriate management and mitigation measures required to minimise the potential environmental impacts.

## 1.3 The Proponent

The Proponent is Hydro Aluminium Kurri Kurri Pty Ltd (Hydro). The contact details for Hydro are:

PO BOX 1

Kurri Kurri NSW 2327

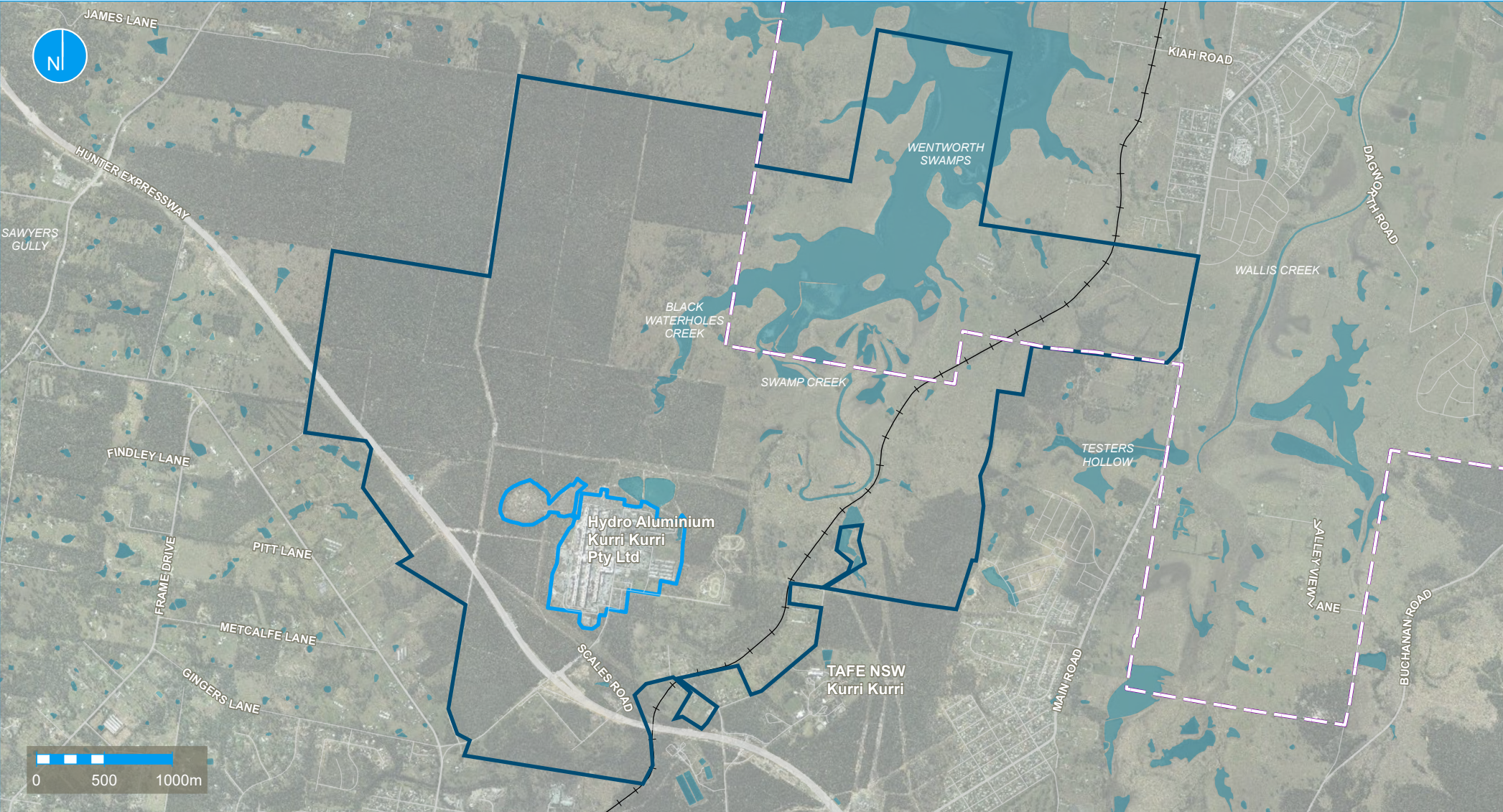
Phone: (02) 4937 1555

Website: <https://regrowthkurrikurri.com.au/> (Hydro Remediation Project website)

## 1.4 Document Structure

This SEE has the following structure:

- **Section 1. Background:** introduces the SEE, provides an overview of the Modification and details of the Proponent, describes the Site location and setting and provides the historical context of the Site and the relevant existing approvals and licences.
- **Section 2. Assessment Requirements:** outline the Secretary's Environmental Assessment Requirements issued by the Department, the issues provided by relevant government agencies to the Department.
- **Section 3. Modification Description:** provides a detailed description of the Modification, a comparison to the approved operation, information on the alternatives considered during the development of the Modification and a justification of the need for the Modification.
- **Section 4. Planning and Statutory Setting:** includes information on the requirements under relevant legislation and environmental planning instruments.
- **Section 4. Stakeholder Consultation:** a summary of the consultation that occurred during preparation of the SEE, and where these issues have been addressed where applicable in the SEE.
- **Section 6. Environmental Assessment:** provides details of the potential environmental impacts and proposed mitigation or management measures to address any potential impacts.
- **Section 7. Management and Mitigation Summary:** a summary of the proposed management and mitigation measures and how each would be implemented.
- **Sections 8. Conclusion and Justification:** provides a justification of the Modification and conclusion to the SEE.
- **Appendices:** supporting documentation to supplement the SEE:
  - The Leachate Management Plan, which forms part of the Remediation Works Environmental Management Plan (Ramboll, 2021)
  - The design drawings for the leachate storage ponds
  - The Temporary Water treatment Plant design
  - Copies of correspondence between Hydro and government agencies



Imagery © Department of Customer Service 2020

- Legend**
- Hydro owned land
  - Project site
  - LGA boundary

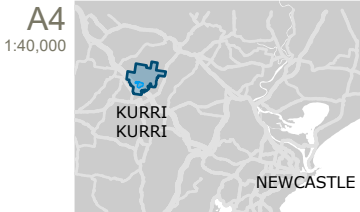


Figure 1-1 | Smelter and Hydro Land Locality Plan

## 1.5 History of Activities Overview

**Table 1-1** provides a summary of the key milestones relating to the Smelter to date, including previously granted post-operation development consents.

**Table 1-1: Overview of key project milestones**

Date	Milestone
1969	<ul style="list-style-type: none"> <li>Commencement of operations at the Smelter.</li> </ul>
September 2012	<ul style="list-style-type: none"> <li>Smelting activities cease.</li> </ul>
May 2014	<ul style="list-style-type: none"> <li>Hydro formally announce the closure of the Smelter.</li> </ul>
August 2015	<ul style="list-style-type: none"> <li>Development Application (DA) 8/2015/399/1 submitted to Council for 'Stage 1 Demolition' of the Smelter. Stage 1 Demolition includes generally the following activities:</li> <li>Demolition of designated buildings at the Smelter excluding: the storage buildings; transformer yard and major power supply infrastructure; three concrete stacks and one concrete water tower; and designated workshops, offices, electrical substations and water supply buildings</li> <li>Construction of a contractor's compound to be used by the demolition contractor</li> <li>Ancillary facilities such as car parks, offices and amenity buildings</li> <li>A demolition materials stockpile area for approximately 35,000 tonnes (t) of scrap metal, 36,000 t of concrete and brick and small amounts of green and non-recyclable demolition waste</li> <li>Sorting of recyclable metallic demolition materials and transportation to a metal recycling facility.</li> </ul>
March 2016	<ul style="list-style-type: none"> <li>Council granted development consent for Stage 1 Demolition.</li> </ul>
July 2016	<ul style="list-style-type: none"> <li>SSD 6666 EIS submitted for the remediation of contaminated soils, waste management including a Containment Cell, on site leachate treatment and 'Stage 2 Demolition'.</li> </ul>
July 2017	<ul style="list-style-type: none"> <li>Stage 1 Demolition commenced.</li> </ul>
January 2018	<ul style="list-style-type: none"> <li>Due to delays to the approval of SSD 6666, a separate application (DA 8/2018/46) for Stage 2 Demolition was submitted to Council. Stage 2 Demolition were subsequently withdrawn from SSD 6666.</li> </ul>
May 2018	<ul style="list-style-type: none"> <li>DA 8/2018/46 for Stage 2 Demolition approved by Council. Stage 2 Demolition generally includes the following activities:</li> <li>Completion of hazardous materials removal</li> <li>Establishment and implementation of environmental controls (dust mitigation and water quality management)</li> <li>Demolition of three concrete stacks and a water tower using detonation</li> <li>Mechanical demolition of remaining buildings and structures</li> <li>Material collection, separation, processing and storage</li> <li>Transportation of recyclable metals offsite</li> <li>Grading of former building footprints</li> <li>Operation of a concrete and refractory crushing plant</li> <li>Manage a large stockpile area in the west of the Smelter</li> <li>Ferrous (steel) and non-ferrous (predominantly aluminium and copper) metals would be sorted and sized before being transported offsite for recycling.</li> </ul>
July 2018	<ul style="list-style-type: none"> <li>Stage 2 Demolition commenced.</li> </ul>
August 2020	<ul style="list-style-type: none"> <li>Final RtS report submitted for SSD 6666.</li> </ul>

Date	Milestone
December 2020	<ul style="list-style-type: none"> <li>• Development consent for SSD 6666 issued. SSD 6666 generally approves the following activities:</li> <li>• Continued use of the Stage 1 Demolition compounds, stockpile and storage areas</li> <li>• Establishment of environmental controls such as erosion and sediment and water quality controls</li> <li>• Construction of the Containment Cell including base and capping layers</li> <li>• Construction of a haul road to the Containment Cell</li> <li>• Transport and placement of remediation and non-recyclable demolition materials to the Containment Cell</li> <li>• Leachate and stormwater management/monitoring</li> <li>• Excavation of contaminated soils within the Site</li> <li>• Removal of the CWS</li> <li>• Transport of waste material removed from the CWS and excavated contaminated soils (including stockpiled soils sourced from other Hydro owned land) to the Containment Cell</li> <li>• Filling and grading following removal of contaminated materials</li> <li>• Leachate management system, pumping well network and dam decommissioning.</li> </ul>

### 1.6 Current Infrastructure

The current remaining infrastructure at the Smelter is shown on **Figure 1-2** and includes:

- Contractor compounds, stockpile areas and storage areas.
- CWS: contains mixed smelter waste from the early 1970's to the early 1990's. It is known to contain spent pot lining, cryolite, alumina, floor sweepings (alumina, cryolite, carbon), shot blast dust (carbon, steel shot), cement, pot lining mix, asbestos containing materials, coal tar pitch and small amounts of other materials such as plastics, wood and steel.
- Clay Borrow Pit: historically used to source clay used for capping the CWS. This is the approved location for the Containment Cell.
- Crushing plant: A concrete and brick crushing plant capable of processing up to 28,000 t per year or 140 t per day.
- Site water management system including:
  - Subsurface and open surface water drainage throughout the Smelter
  - The Western Surge Pond, the Eastern Surge Pond and the Southern Surge Pond. These are the initial collection and treatment settling points for the Smelter stormwater
  - The North Dam: comprises two dams located immediately north of the Site used as part of the water collection and treatment system for the Smelter. The North West Dam collects water from the Western Surge Pond and some of the site before it discharges to North East Dam. Water from the North East Dam is then discharged to the irrigation area in accordance with the Hydro Environment Protection Licence (EPL)
  - Irrigation area located on part Lot 1 DP 543057
  - Water cart filling station
- Spent pot lining storage sheds: Sheds used for the storage of spent pot lining immediately south of the CWS continue to store spent pot lining and other smelter wastes
- Remanent buildings: Several smelter buildings remain at the site. These include the Administration buildings and workshop buildings.

## **1.7 The Project**

As noted in Section 1.1 Hydro holds development consent State Significant Development (SSD) 6666 issued under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 23 December 2020 for remediation of the Smelter for the Project.

The key elements of the Project (as described in Schedule 1 of the development consent for the Project) are:

- Excavation of onsite contaminated areas
- Excavation and treatment of Capped Waste Stockpile (CWS) material
- Construction of a purpose-built containment cell
- Placement of contaminated materials in the containment cell
- Treatment of contaminated groundwater plume originating from the CWS
- Ongoing management of the containment cell in perpetuity

As of early April 2021, limited Project activities have been undertaken: vegetation clearance within the Containment Cell footprint; fauna proof fencing around the Containment Cell footprint; and installation of environmental controls have occurred. Construction of the Containment Cell, disturbance of the Capped Waste Stockpile and construction of the haul road have not yet commenced.

The Containment Cell will include a leachate drainage, collection and storage system. The storage system includes a leachate storage dam with one megalitre (1 ML) capacity referred to in this SEE as the Containment Cell Leachate Pond.



RAMBOLL AUSTRALIA - GIS MAP file : 318000533 GIS\_P001 RemediationEMP | F002 Smelter\_V02 | 2/11/2020

Aerial photography by Nearmap, flown 15.06.2020

## Legend

Project site

A4  
1:8,000

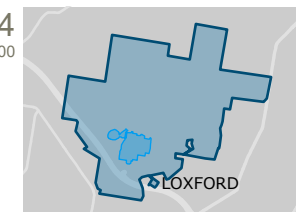


Figure 1-2 | Existing Smelter Layout

## 2. ASSESSMENT REQUIREMENTS

### 2.1 Secretary's Environmental Assessment Requirements

Hydro submitted a request for the Secretary's Environmental Assessment Requirements (SEARs) on 27 January 2021, which were issued by the Department on 4 March 2021. Table 2-1 addresses the SEARs and where they are addressed in this SEE.

**Table 2-1: Modification SEARs and where addressed**

Requirement	Where Addressed
<b>1. Description of the modification</b> , including: <ul style="list-style-type: none"> <li>a detailed description of the proposed temporary water treatment system, including the capacity of leachate storage basins and water holding tanks</li> <li>a description of the relationship with and changes to existing development and any staging</li> <li>identification of conditions to be modified and proposed wording of any new or modified conditions</li> <li>identification of any proposed variations to other licences and approvals</li> </ul>	Section 3 Section 3.9 Section 3.9.2 Section 4.2.3
<b>2. Details of the existing site</b> , including: <ul style="list-style-type: none"> <li>a description of existing and approved development, including licences or statutory approvals that apply to these</li> <li>a summary of the existing conditions of consent that would be relevant to the proposal</li> <li>a summary of the existing environmental management and monitoring regime</li> <li>detailed plans of the existing and proposed site layout and structures</li> <li>a table detailing compliance with existing conditions of consent.</li> </ul>	Section 1.6, Section 1.7 Figure 1-2, Section 3.9.2 and Section 4.2.3 Section 3.9.2 Section 6 Figure 3-2, Figure 3-3, Appendix 2 and Appendix 2 Section 3.9.2
<b>3. Assessment of the modification</b> , including: <ul style="list-style-type: none"> <li>a detailed assessment of the key issues specified below, the public authority requirements and any other significant issues identified by a risk assessment, which includes:               <ul style="list-style-type: none"> <li>an assessment of all potential impacts of the proposed modification on the existing environment and measures to avoid, minimise, mitigate and/or manage these potential impacts, including proposals for adaptive management and/or contingency plans to manage any significant risks to the environment</li> <li>an assessment of the potential impacts of all stages of the proposed modification, including decommissioning and any cumulative impacts with the existing site.</li> </ul> </li> </ul>	Section 6 Section 6
<b>4. Strategic and statutory context</b> , including: <ul style="list-style-type: none"> <li>the need and justification for the proposed modification having regard to its location and impacts, the suitability of the site and the public interest;</li> <li>consideration of all relevant legislation, strategies, environmental planning instruments, including identification for any inconsistencies</li> </ul>	Section 3.11 Section 4

Requirement	Where Addressed
<ul style="list-style-type: none"> <li>detailed justification the proposal is substantially the same development as the development to which consent was originally granted, as per s4.55(2) of the EP&amp;A Act.</li> </ul>	<p>Section 3.9.3</p> <p>Note that the Modification would be approved under s4.55(1A)</p>
<p><b>5. Soil and water</b>, including:</p> <ul style="list-style-type: none"> <li>an assessment of potential surface and ground water impacts of construction, operation decommissioning of the water treatment plant, including full characterisation of leachate to be treated, the suitability of the water treatment plant to treat all pollutants and potential impact on the downstream receiving environment</li> <li>detailed site water balance</li> <li>details of proposed mitigation, management and monitoring measures.</li> </ul>	<p>Section 6.1</p> <p>Section 3.1.1.2</p> <p>Section 6.1.3</p>
<p><b>6. Traffic</b>, including an assessment of the impact of changes in traffic movements due to the proposed modification.</p>	<p>Section 6.5</p>
<p><b>7. Waste Management</b>, including:</p> <ul style="list-style-type: none"> <li>a description of the waste streams that would be generated by the construction, operation and decommissioning of the water treatment plant</li> <li>details of the waste management strategy for the construction and ongoing operational waste generated</li> </ul>	<p>Section 3.3 and Section 6.7</p> <p>Section 6.7.3</p>
<p><b>8. Hazard and risk</b>, including an assessment of any changes to hazard and risk screening outcomes due to the proposed modification, in particular for human exposure to contaminated leachate.</p>	<p>Section 6.2</p>
<p><b>9. Consultation</b> with relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners, particularly EPA and DPIE Water.</p>	<p>Section 5</p>
<p><b>10.</b> A table indicating where each element of the SEARs is addressed should be included in the modification application.</p>	<p>This table</p>

## 2.2 Agencies' Issues

In preparing the SEARs the Department consulted with the government agencies involved with SSD 6666. The agencies' responses were provided to Hydro: Table 2-2 addresses the agencies' issues and where they are addressed in this SEE.

**Table 2-2: Agencies issues and where addressed**

Agency Issues	Where Addressed
<p><b>Cessnock City Council</b></p> <p>Council has no objection to the modification</p>	<p>Noted</p>
<p><b>Department of Planning, Industry and Environment – Water Knowledge Office</b></p> <ul style="list-style-type: none"> <li>The identification of an adequate and secure water supply for the life of the project. This includes confirmation that water can be sourced from an appropriately authorised and reliable supply. This is also to include an assessment of the current market depth where water entitlement is required to be purchased.</li> </ul>	<p>No water supply is required for the TWTP</p>

Agency Issues	Where Addressed
<ul style="list-style-type: none"> <li>A detailed and consolidated site water balance</li> <li>Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts.</li> <li>Proposed surface and groundwater monitoring activities and methodologies</li> <li>Consideration of relevant legislation, policies and guidelines, including the NSW Aquifer Interference Policy (2012), the Guidelines for Controlled Activities on Waterfront Land (2018) and the relevant Water Sharing Plans</li> </ul>	<p>Section 3.1.1.2</p> <p>Section 6.1 (assessment of impacts on surface water and groundwater)</p> <p>The Modification does not require, or would lead to, disturbance of watercourses, riparian land, water supply infrastructure, or any landholder rights</p> <p>Section 6.1</p> <p>Not applicable: the proposal would not impact on aquifers, include activities on waterfront land, or use water from watercourses</p>
<p><b>Environment Protection Authority</b></p> <p><b>Surface Water Assessment</b></p> <p>The EPA recommends that the applicant provides an updated, consolidated report that includes (at a minimum):</p> <ul style="list-style-type: none"> <li>A contemporary characterisation of the influent leachate quality and the receiving water quality within the Northern Dam and downstream receiving environments for all pollutants likely to be present at non-trivial levels.</li> <li>The expected discharge quality from the Water Treatment Plant</li> <li>The expected combined discharge quality from the Northern Dam (with the addition of WTP discharge) under a range of operational and climatic scenarios (e.g. wet weather, dry weather)</li> <li>An assessment of the potential impact of the proposed discharge (to both land and the downstream receiving environment) with reference to the appropriate guidelines, including but not limited to: <ul style="list-style-type: none"> <li><i>Australian &amp; New Zealand Guidelines for Fresh and Marine Water Quality</i> (ANZG (2018))</li> <li><i>Environmental Guidelines: Use of Effluent by Irrigation</i> (NSW DEC 2004)</li> </ul> </li> <li>Demonstrates that the water treatment plant systems (leachate storage basins, treated water holding tanks) are appropriately sized</li> <li>A water treatment plant validation monitoring program.</li> <li>A soil, surface and groundwater monitoring program that assesses controlled (via irrigation) and uncontrolled overflows from the North East Dam.</li> <li>The practical measures that will be taken to prevent, control or mitigate pollution including contingencies that will be implemented if WQOs are not met</li> </ul>	

Agency Issues	Where Addressed
<p><b>Groundwater Assessment</b></p> <p>The proponent has not justified that the leachate pond lining construction will be suitable to fully contain the leachate or enable suitable lining performance monitoring. Whilst a 2mm HDPE lining was noted, there is no supporting information demonstrating that this has been tested and found to be adequate to prevent leachate material from infiltrating the lining.</p> <p><b>Waste and Contaminated Lands Assessment</b></p> <p><b>Managing leachate contaminated liquid generated at the premises</b></p> <p>The containment cell leachate pond and leachate holding pond do not appear to have been designed using a water balance for the operations. Instead it appears to be event based. It is not clear that the leachate containment and treatment system have enough capacity based on the limited information provided.</p> <p>Whilst contingencies exist to truck the leachate from the site when the system is not able to contain/process the excess leachate, the system should be designed using a water balance for the proposed operations in accordance with the Environmental Guidelines Solid Waste Landfills (2016) and details provided on any anticipated shortfall for onsite containment and treatment</p> <p><b>Leachate Holding Pond construction</b></p> <p>The limited details provided for the design and construction of the leachate holding pond are not adequate to assess the capacity to contain and manage the leachate generated.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> <li>Leachate storage (design, construction and operation) be consistent with the technical specifications outlined in the <i>Environmental Guidelines Solid Waste Landfills</i> (2016)</li> <li>Before major construction works occur, the proponent prepares a Construction Quality Assurance Plan. This must set out the proposed testing, inspection and other verification procedures to be implemented during construction of the leachate containment works.</li> <li>Following construction, the occupier must prepare a Construction Quality Assurance Report on the quality assurance that was implemented to ensure that the works comply with the approved designs and specifications.</li> </ul> <p><b>Transfer pipe installation</b></p> <p>Transfer pipes are not usually banded and the required frequency for routine checks is adequate given the temporary nature of the works. However, the transfer pipe should be pressure tested prior to commissioning to verify that there are no leaks.</p> <p><b>Monitoring Parameter Suite</b></p> <p>The monitoring suite be broadened to include Poly Aromatic Hydrocarbons, Total Recoverable Hydrocarbons and Heavy metals.</p>	<p>Section 3.5.2.1</p> <p>Section 3.1.2.3</p> <p>Section 3.1.2.3</p> <p>Section 0</p> <p>Section 0</p> <p>Section 3.5.2.2</p> <p>Section 3.1.1.1, Section 3.6.2 and Section 6.1.3</p>

Agency Issues	Where Addressed
<p><b><i>Additional Issues</i></b></p> <p><b>Geotube</b></p> <p>The waste sludge generated from the TWTS is to be processed in a Geotube. These tubes can leak, and spills and ruptures can occur.</p> <p>That the Geotube containing sludge be in placed in a bunded/contained area.</p> <p><b>Spent Media</b></p> <p>The spent media from the TWTS is to be placed into the containment cell. This will be a concentrated waste stream which is likely to have high concentrations of contaminants.</p> <p>Confirmation should be provided that the containment cell is suitably designed to manage these wastes.</p>	<p>Section 3.1.4</p> <p>Section 3.3 and Section 6.7</p>

## 3. MODIFICATION DESCRIPTION

### 3.1 Overview

The Modification is comprised of the following activities:

- Construction of:
  - An onsite TWTP
  - A 1 ML leachate storage basin near the Containment Cell (the Containment Cell Leachate Pond)
  - A pipeline connecting the Containment Cell Leachate Pond to the TWTP
  - A 1 ML leachate storage basin near the TWTP (the Leachate Holding Pond)
  - Associated pipelines and infrastructure
- Operation and ongoing maintenance of the TWTS
- Discharge of treated leachate to the existing Smelter water management system
- Decommissioning of the TWTS.

The key components of the Modification are shown on **Figure 3-2**. The proposed location of the TWTP, the Containment Cell Leachate Pond and the Leachate Holding Pond are consistent with the conceptual locations shown on Figure 25A in Appendix 25 of the RtS.

The TWTS has been designed to manage all the leachate expected to be generated during the Project. Offsite treatment of leachate (as described in the RtS) could still occur if required where volumes may exceed the capacity of the onsite TWTP, such as following or during heavy rain events.

#### 3.1.1 Leachate characteristics

##### 3.1.1.1 Quality

Eleven samples of the Capped Waste Stockpile leachate have been collected and sampled on two occasions: in 2015 (to inform the Containment Cell Detailed Design) and 2019 (to inform the TWTP design). **Table 3-1** summarises the results for the key parameters from the two sampling events.

**Table 3-1: Capped Waste Stockpile Leachate Key Parameters**

Physico-Chemical Parameters	Units	No. of Samples	No. of Non-Detects	Min	Max	Mean
pH	pH units	5	0	10.5	11	10.8
EC	µS/cm	2	0	40600	51600	46100
<b>Alkalinity</b>						
Hydroxide Alkalinity as CaCO <sub>3</sub>	mg/L	3	3	<1	1	1
Carbonate Alkalinity as CaCO <sub>3</sub>	mg/L	4	0	10540	26700	22035
Bicarbonate Alkalinity as CaCO <sub>3</sub>	mg/L	3	0	242	727	565.3
Total Alkalinity as CaCO <sub>3</sub>	mg/L	6	0	17100	48400	27850
<b>Sulfate</b>						
Sulfate as SO <sub>4</sub> - Turbidimetric	mg/L	6	0	1250	9460	5740
<b>Chloride</b>						
Chloride	mg/L	6	0	460	810	602.2
<b>Sodium</b>						
Sodium	mg/L	7	0	4800	17400	13628.6
<b>Potassium</b>						
Potassium	mg/L	8	0	13	168	86.1
<b>Calcium</b>						
Calcium	mg/L	4	2	<0.8	30	9.0
<b>Magnesium</b>						
Magnesium	mg/L	4	0	<0.2	2	1.6
<b>Silicon</b>						
Silicon	mg/L	1	0	25	25	25
<b>Sulphide</b>						
Sulphide	mg/L	1	0	126	126	126

Physico-Chemical Parameters	Units	No. of Samples	No. of Non-Detects	Min	Max	Mean
<b>Metals</b>						
Aluminium	µg/L	5	1	200	2860	1452
Mercury	µg/L	3	3	<0.1	0.1	0.1
Arsenic	mg/L	2	0	0.7	1	0.9
Bismuth	mg/L	2	1	0.1	0.15	0.1
Cadmium	mg/L	2	2	<0.01	0.05	0.03
Cobalt	mg/L	2	0	0.2	0.27	0.2
Chromium	mg/L	2	1	0.05	0.1	0.08
Copper	mg/L	2	0	0.6	1.05	0.8
Manganese	mg/L	2	2	<0.05	0.1	0.08
Molybdenum	mg/L	2	0	1.25	1.5	1.4
Nickel	mg/L	2	0	1.35	2.1	1.7
Lead	mg/L	2	1	0.1	0.3	0.2
Antimony	mg/L	2	2	<0.1	0.2	0.2
Iron	mg/L	3	0	20	79	45
Tin	mg/L	2	2	<0.1	0.1	0.1
Vanadium	mg/L	2	0	4.8	7.4	6.1
Zinc	mg/L	2	1	0.1	0.35	0.2
Tungsten	mg/L	2	1	0.2	0.4	0.3
<b>Uranium</b>						
Uranium	mg/L	2	1	0.1	3	1.6
<b>Cyanide</b>						
Total Cyanide	mg/L	10	0	7.81	227	142.1
Free Cyanide	mg/L	5	5	<0.005	0.4	0.2
<b>Fluoride</b>						
Fluoride	mg/L	11	0	0.2	4200	2112.7

Physico-Chemical Parameters	Units	No. of Samples	No. of Non-Detects	Min	Max	Mean
<b>PCBs</b>						
Total Polychlorinated biphenyls	µg/L	3	3	<1	-	-
<b>Polynuclear Aromatic Hydrocarbons</b>						
Naphthalene	µg/L	5	1	1.4	38.8	16.3
Acenaphthylene	µg/L	5	5	<1	-	-
Acenaphthene	µg/L	5	3	<1	3.5	2.4
Fluorene	µg/L	5	3	<1	2.1	1.8
Phenanthrene	µg/L	5	2	<1	6	3.3
Anthracene	µg/L	5	3	<1	2.7	2.0
Fluoranthene	µg/L	5	2	<1	8.8	5.0
Pyrene	µg/L	5	1	<1	8.7	4.8
Benz(a)anthracene	µg/L	5	2	<1	9.2	4.7
Chrysene	µg/L	5	2	<1	8.4	4.5
Benzo(b+j)fluoranthene	µg/L	5	2	<1	17	7.9
Benzo(k)fluoranthene	µg/L	3	1	<1	3.9	2.3
Benzo(a)pyrene	µg/L	5	2	<0.5	10	5.2
Indeno(1.2.3.cd)pyrene	µg/L	5	2	<1	7	3.6
Dibenz(a.h)anthracene	µg/L	5	4	<1	2	1.5
Benzo(g,h,i)perylene	µg/L	5	2	<1	8.2	4.1
Sum of polycyclic aromatic hydrocarbons	µg/L	5	1	<2	122	58.5
Benzo(a)pyrene TEQ (zero)	µg/L	5	2	<0.5	14.7	7.2
<b>Total Petroleum Hydrocarbons</b>						
C6 - C9 Fraction	µg/L	5	2	<100	330	190
C10 - C14 Fraction	µg/L	5	2	<50	200	116
C15 - C28 Fraction	µg/L	5	1	<100	540	364
C29 - C36 Fraction	µg/L	5	0	50	240	120

Physico-Chemical Parameters	Units	No. of Samples	No. of Non-Detects	Min	Max	Mean
C10 - C36 Fraction (sum)	µg/L	5	0	120	840	560
C6-C36 Fraction (sum)	µg/L	5	0	500	2010	1350
<b>Total Recoverable Hydrocarbons</b>						
C6 - C10 Fraction	µg/L	5	2	100	330	192
C6 - C10 Fraction minus BTEX (F1)	µg/L	5	2	90	320	182
>C10 - C16 Fraction	µg/L	5	2	100	330	192
>C16 - C34 Fraction	µg/L	5	0	340	540	446
>C34 - C40 Fraction	µg/L	5	3	100	200	128
>C10 - C40 Fraction (sum)	µg/L	5	0	540	870	666
>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	5	3	100	280	166
<b>BTEXN</b>						
Benzene	µg/L	5	1	3	44	15.6
Toluene	µg/L	5	1	4	10	6
Ethylbenzene	µg/L	5	5	<2	5	3.2
meta- & para-Xylene	µg/L	5	3	2	5	3.8
ortho-Xylene	µg/L	5	5	<2	5	3.2
Total Xylenes	µg/L	5	3	2	5	3.8
Sum of BTEX	µg/L	5	1	5	54	22
Naphthalene	µg/L	5	1	5	58	32.8
<b>OCPs</b>						
OCPs	µg/L	2	2	<2	-	-
<b>OPPs</b>						
OPPs	µg/L	2	2	<2	-	-

Physico-Chemical Parameters	Units	No. of Samples	No. of Non-Detects	Min	Max	Mean
<b>Monocyclic Aromatic Hydrocarbons</b>						
Benzene	µg/L	2	1	5	42	23.5
Toluene	µg/L	2	0	5	11	8
MAHs	µg/L	2	2	<10	-	-
<b>Oxygenated Compounds</b>						
2-Propanone (Acetone)	µg/L	2	1	50	340	195
Oxygenated Compounds	µg/L	2	2	<50	-	-
<b>Sulfonated Compounds</b>						
Carbon Disulfide	µg/L	2	2	<5	-	-
<b>Fumigants</b>						
Fumigants	µg/L	2	2	<5	-	-
<b>Halogenated Aliphatic Compounds</b>						
Halogenated Aliphatic Compounds	µg/L	2	2	<50	-	-
<b>Halogenated Aromatic Compounds</b>						
Halogenated Aromatic Compounds	µg/L	2	2	<5	-	-
<b>Trihalomethanes</b>						
Chloroform	µg/L	2	0	8	19	13.5
Trihalomethanes	µg/L	2	2	<5	-	-
<b>Phenolic Compounds</b>						
Phenolic Compounds	µg/L	2	1	2	12	7
3- &4-Methylphenol	µg/L	2	1	4	8	6
Pentachlorophenol	µg/L	2	2	<4	-	-
Phenolic Compounds	µg/L	2	2	<2	-	-
<b>Phthalate Esters</b>						
Phthalate Esters	µg/L	2	2	<10	-	-

Physico-Chemical Parameters	Units	No. of Samples	No. of Non-Detects	Min	Max	Mean
<b>Nitrosamines</b>						
Nitrosamines	µg/L	2	2	<4	-	-
<b>Nitroaromatics and Ketones</b>						
Nitroaromatics and Ketones	µg/L	2	2	<4	-	-
<b>Haloethers</b>						
Haloethers	µg/L	2	2	<2	-	-
<b>Chlorinated Hydrocarbons</b>						
Chlorinated Hydrocarbons	µg/L	2	2	<10	-	-
<b>Anilines and Benzidines</b>						
Carbazole	µg/L	2	1	<2	4	3
Anilines and Benzidines	µg/L	2	2	<4	-	-
<b>Organotin Compounds (Soluble)</b>						
Tributyltin	ngSn/L	2	2	<15	-	-
<b>Nitrogenated Compounds</b>						
Acrylonitrile	µg/L	2	2	<1	-	-
<b>Aldehydes</b>						
Formaldehyde	µg/L	2	0	168	423	295.5
Acetaldehyde	µg/L	2	0	10.1	19	14.6
Propionaldehyde	µg/L	2	2	<2	-	-
Acrolein (Propenal)	µg/L	2	2	<2	-	-
Butyraldehyde	µg/L	2	1	<2	2.7	2.4
<b>Phenolic Compounds</b>						
Phenolic Compounds	µg/L	2	2	<0.1	-	-
m-Cresol	µg/L	2	1	<0.1	21.6	10.9
o-Cresol	µg/L	2	1	<0.1	10.4	5.3
p-Cresol	µg/L	2	1	<0.1	26	13.1

Physico-Chemical Parameters	Units	No. of Samples	No. of Non-Detects	Min	Max	Mean
2,4-Dichlorophenol	µg/L	2	0	0.3	1.6	1.0
2,6-Dichlorophenol	µg/L	2	0	0.3	0.5	0.4
2,4-Dimethylphenol	µg/L	2	0	0.7	4.3	2.5
Pentachlorophenol	µg/L	2	1	<0.05	0.39	0.2
Phenol	µg/L	2	1	<0.1	123	61.6
2,4,5-Trichlorophenol	µg/L	2	1	<0.1	0.1	0.1
2,4,6-Trichlorophenol	µg/L	2	1	<0.1	0.3	0.2
<b>Phenoxyacetic Acid Herbicides</b>						
Phenoxyacetic Acid Herbicides	µg/L	2	2	<10	-	-
<b>Explosives</b>						
Explosives	µg/L	2	2	<20	-	-
<b>Perfluorinated Compounds</b>						
PFOS	µg/L	2	2	<0.05	-	-
PFOA	µg/L	2	2	<0.05	-	-
PFAS Compounds	µg/L	2	2	<0.5	-	-
<b>Thiocarbamates and Carbamates</b>						
Thiocarbamates and Carbamates	µg/L	2	2	<0.1	-	-
<b>Dinitroanilines</b>						
Pendimethalin	µg/L	2	2	<0.05	-	-
Trifluralin	µg/L	2	2	<10	-	-
<b>Triazinone Herbicides</b>						
Hexazinone	µg/L	2	2	<0.02	-	-
Metribuzin	µg/L	2	2	<0.02	-	-
<b>Conazole and Aminopyrimidine Fungicides</b>						
Conazole and Aminopyrimidine Fungicides	µg/L	2	0	<0.05	-	-

Physico-Chemical Parameters	Units	No. of Samples	No. of Non-Detects	Min	Max	Mean
<b>Phenylurea, Thizdiazolurea, Uracil and Sulfonylurea Herbicides</b>						
Phenylurea, Thizdiazolurea, Uracil and Sulfonylurea Herbicides	µg/L	2	2	<0.2	-	-
<b>Chloracetanilides</b>						
Metolachlor	µg/L	2	2	<0.01	-	-
<b>Triazine Herbicides</b>						
Triazine Herbicides	µg/L	2	2	<0.05	-	-
<b>Miscellaneous Pesticides</b>						
Miscellaneous Pesticides	µg/L	2	2	<1	-	-

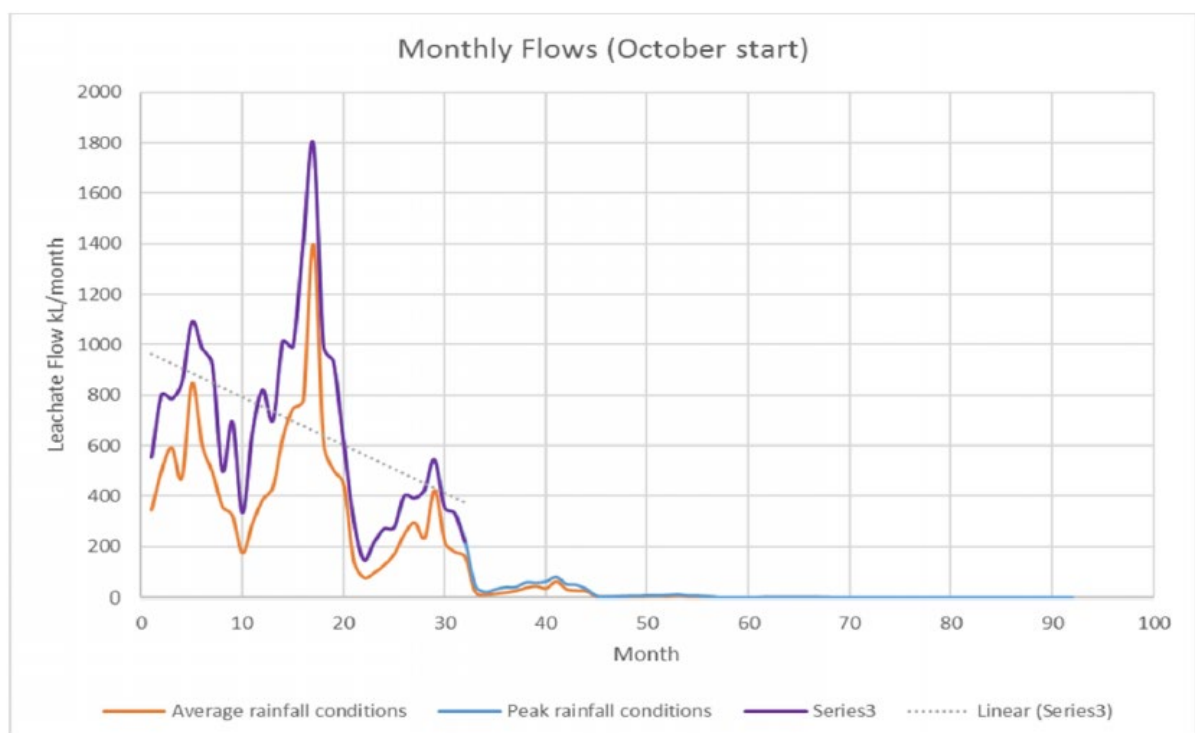
The leachate quality and the concentrations of the various parameters would be variable: it is a large amount of heterogenous waste materials, and so concentrations would depend on what waste materials are in the area that samples were collected. This variability would be further exasperated during the removal and relocation of the Capped Waste Stockpile material: for example the waste types exposed during a rain event and the dilution effect of the rain event would be influential.

### 3.1.1.2 Modelled quantity

Appendix C (Leachate Management Options Assessment Report) of the Detailed Design Report (GHD, 2018) includes modelling of leachate generated during excavation of the Capped Waste Stockpile and the various stages of construction, filling and completion of the Containment Cell. The modelling considered two rainfall scenarios:

- A 50% Annual Exceedence Probability (AEP) rainfall year (mean rainfall)
- A 90% AEP rainfall year (high rainfall)

Leachate modelling estimates 11 ML of leachate will be generated over the 20 months of removing the Capped Waste Stockpile and filling the Containment Cell, with variability based on rainfall levels. **Figure 3-1** shows the predicted leachate modelling.



**Figure 3-1: Estimated leachate generation (Source: GHD, 2018)**

**Figure 3-1** shows that leachate generation is rainfall dependent as the waste is non-leachate generating. Therefore, leachate generation occurs with rainfall. As the graph shows the estimated highest leachate generation rate is 1.8ML/ month. **Section 3.1.2** outlines how this leachate would be collected and stored.

### **3.1.2 Collection and storage of leachate**

#### **3.1.2.1 Containment Cell**

As discussed in the EIS and the RtS, the material placed within the Containment Cell is expected to have retained moisture. In addition, any rain that falls within the Containment Cell would be managed as leachate. The RtS describes the Containment Cell leachate collection system that would be managed during material placement. This includes temporary in cell storage of 1 mega litre (ML) and a Leachate Pond with 1 ML capacity.

The location and design for the Containment Cell Leachate Pond is presented in Appendix J of the Containment Cell Detailed Design Report, which forms Appendix 3 of the RtS.

- Leachate within the Containment Cell Leachate Pond would be pumped out and transported to the Leachate Holding Pond via a HDPE pipe (as shown on **Figure 3-2**) when:
- The pond reaches 85% capacity
- A heavy rain event is forecast.

#### **3.1.2.2 Capped Waste Stockpile**

As discussed in the EIS and the RtS, the material within the CWS is expected to have retained moisture and potentially some perched water. In addition, any rain that falls within the opened CWS would be managed as leachate.

A Leachate Holding Pond would be constructed adjacent to the CWS in the location shown on **Figure 3-2**. The Leachate Holding Pond would have a 1 ML capacity.

As removal of material from the CWS progresses, a temporary storage basin (Leachate Storage Basin) would be established within the CWS footprint to capture leachate. The basin would also have a holding capacity of 1 ML.

When required, leachate from the Leachate Storage Basin would be pumped to the Leachate Holding Pond where it would be stored until treatment. A 100 mm diameter pipeline (transfer pipe) would be located as shown in **Figure 3-2** and would connect the Leachate Holding Pond to the TWTP.

#### **3.1.2.3 Leachate storage capacity**

As discussed in Section 3.1.2.1 and 3.1.2.2 storage for 4ML of untreated leachate would be constructed. During extreme event additional storage within the Containment Cell and Capped Waste Stockpile would be available, however this would mean flooding of waste within the Containment Cell.

The design of the Containment Cell Leachate Pond and Leachate Holding Pond form part of the Detailed Design Report prepared by GHD (2018). Appendix C of the report (Leachate Management Options Assessment Report) included consideration of predicted leachate quantity. This included modelling of leachate generated during excavation of the Capped Waste Stockpile and the various stages of construction, filling and completion of the Containment Cell. The modelling considered two rainfall scenarios:

- A 50% Annual Exceedence Probability (AEP) rainfall year (mean rainfall)
- A 90% AEP rainfall year (high rainfall)

The Detailed Design Report estimated that the highest leachate generation rate would be 1.8ML/month. As a result if there were operational issues with the TWTP, and leachate could not be transported for off site treatment, there would be more than two months of constructed storage of untreated leachate available at this maximum leachate generation rate. There would be

additional storage capacity if leachate was allowed to flood material within the Containment Cell and the CWS.

### 3.1.3 Transfer of leachate

A surface-laid 100 mm diameter high-density polyethylene (HDPE) pipe would be installed to transfer leachate from the Containment Cell Leachate Pond to the Leachate Holding Pond as shown on **Figure 3-2**. Leachate would be pumped from the Containment Cell Leachate Pond to the Leachate Holding Pond when the pond reaches 85% capacity or a heavy rain event is forecast.

### 3.1.4 Treatment of leachate

#### 3.1.4.1 Onsite treatment – Temporary water treatment plant

The TWTP would be located as shown in **Figure 3-3**, within 20 m of the edge of the Leachate Holding Pond and would be powered by a diesel generator.

The plant is designed to treat and discharge a maximum of 2,400 kL/month. Based on estimates of leachate generation from the relevant Project elements the TWTP would require an estimated capacity of 30 kL/day.

The TWTP would be comprised of the components summarised in **Table 3-2**. A process diagram for the TWTP is shown in **Figure 3-3**.

**Table 3-2: Temporary Water Treatment System Key Components**

Component	Description
Pre-Treatment System	<p>The pre-treatment system would have a capacity of 3 litres per second (L/s) and is comprised of:</p> <ul style="list-style-type: none"> <li>Flocculator</li> <li>Lamella Dissolved Air Flocculation (DAF)</li> <li>Sand filter feed tank.</li> </ul> <p>The purpose of the pre-treatment system is to undertake pH correction and to remove the bulk of suspended solids prior to passing through the filter vessels.</p> <p>Polymers, coagulant (CaCl<sub>2</sub>) and sulfuric acid would be added to the flocculator to aid flocculation of the materials.</p>
Sludge Dewatering Bags	<p>Sludge would be produced in the form of settled solids within the DAF unit. Sludge would be pumped out from the bottom of DAF unit and pass through the sludge dewatering Geotube. The removed sludge would be dried and disposed of within the Containment Cell while available and to an offsite licensed waste facility when the Containment Cell has been capped. The filtered leachate would then pass back through the pre-treatment system.</p>
Sand Filter	<p>Following pre-treatment, the leachate would be pumped to the Sand Filter Feed Tank before passing through the Sand Filter to further remove any solid materials. The sand filter would be driven by pressure at a rate of up to 3 L/sec.</p>
Zeolite Filter	<p>Leachate from the Sand Filter would be passed through a Zeolite Filter. The zeolite filter acts as both a secondary filtration stage and an initial adsorption stage.</p>

Component	Description
Granular Activated Carbon (GAC) Filter	After the Zeolite filtration, the water would be processed through the Granular Activated Carbon (GAC) filters. Treatment with GAC involves passing a liquid to be treated through a bed of GAC. GAC removes a range of compounds, especially dissolved phase hydrocarbons, Fluoride and Cyanide through the process of adsorption. Organic and inorganic compound in the water are attracted to the surface of the activated carbon.  Potassium peroxymonosulfate would be added as an oxidising agent.
Adsorption and Ion Exchange Module	A two stage Ion Exchange process using an anion base resin would be used after the GAC adsorption process. Anion resin would remove a range of compounds, especially Fluoride and Cyanide, through the process of Ion Exchange.  Sodium hydroxide would be added to regenerate the resins.
Bag Filter	Following adsorption and ion exchange, leachate would be passed through a small bag made of filtering material with a pore size of 1 µm.
Treated Water Holding Tanks	The four Holding Tanks would store the treated leachate prior to discharge. Each tank has a 100 kL capacity.
Various pumps	Including leachate pumps, collection pumps, sludge transfer pumps, dewatering pumps, re-circulating pumps, GAC filter feed pumps, backwash pumps, treated water pumps and discharge pumps to transport liquid between each component.
Bunding	The TWTP (including all of the above elements) would be constructed inside a bund which would be designed to contain any spillage/ leaks if they are to occur. The bund would contain a sump from which any collected water can be transferred to the head of the plant for treatment.

### 3.1.5 Clean water discharge

The clean water discharge would be located near the CWS. Once leachate has been treated, tested (against the criteria described in **Section 3.6.2**) and approved for discharge, the water would be pumped into the Eastern Surge Pond and to the Smelter water management system.

### 3.1.6 Ancillary infrastructure

#### 3.1.6.1 Chemical storage

As noted in **Table 3-2** a number of chemicals need to be used in the TWTP. The chemicals would be managed and stored within a facility designed in accordance with the:

- NSW Environmental Protection Authority *Storing and Handling of Liquids: Environmental Protection – Participants Manual* (Department of Environment and Climate Change, 2007)
- *Work Health and Safety Act 2011*
- SafeWork NSW *Storage and Handling of Dangerous Goods Code of Practice 2005*
- Australian Standard (AS) 1940-2017 *The storage and handling of flammable and combustible liquids*
- Safety Data Sheet (SDS) for each chemical.

A minimal amount of chemicals would be stored onsite: chemicals would be regularly transported to site as required. The chemicals would be stored in self-bunded intermediate bulk containers (IBC) and located within the bunding for the TWTP.



RAMBOLL AUSTRALIA - GIS MAP file : 318000533\_GIS\_P001\_RemediationEMP | F018\_LeachateLight\_V02 | 30/07/2020

Aerial photography by Nearmap, flown 15.06.2020

## Legend

- Project site
- Leachate storage dam
- Leachate treatment plant
- Leachate pipeline

A4  
1:8,000

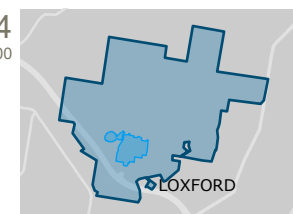


Figure 3-2 | Location of Leachate Management Infrastructure

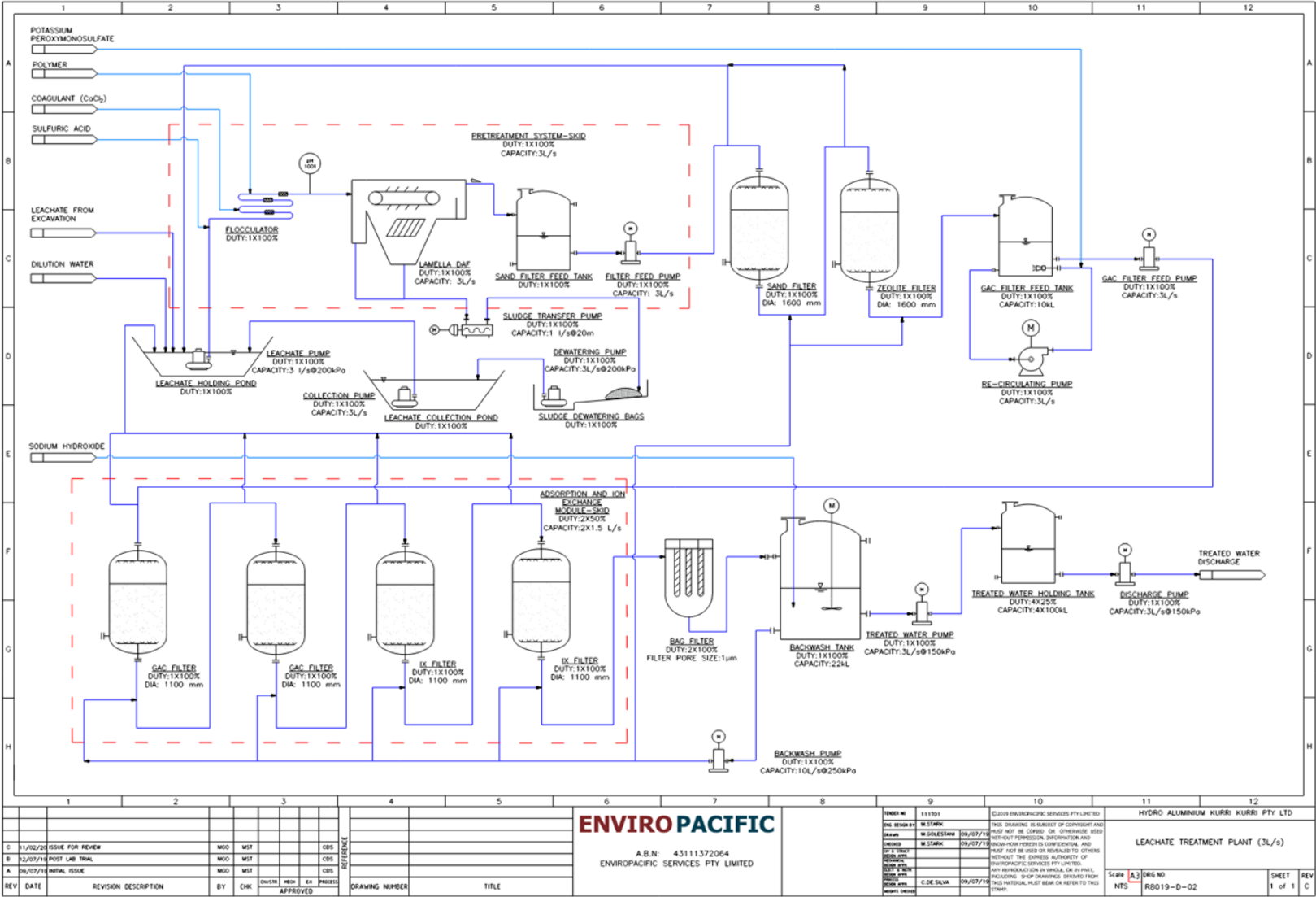


Figure 3-3: TWTP Process Diagram

### 3.2 Environmental management

A Remediation Works Environmental Management Plan (RWEMP) has been prepared and approved by the Department to describe how environmental management would be undertaken during the Project. It was prepared to address the requirements of Condition C2 of the development consent for SSD 6666, including the specialist management plans required by Condition C3 of the development consent. The RWEMP would apply to the construction, operation and decommissioning of the TWTS. The RWEMP would be amended as required to reflect the additional environmental management measures in Section 7.

Hydro prepared several specialist management plans as part of the RWEMP in addition to those required by Condition C3 of the development consent. This included a Soil and Water Management Plan (SWMP), which incorporates a Leachate Management Plan (LMP) that describes how leachate, and leachate infrastructure, would be managed to minimise the potential environmental impacts. A copy of the LMP is provided in **Appendix 1**.

### 3.3 Waste management

Table 3-3 outlines the waste streams that would be generated by operation and maintenance of the TWTS and outlines the proposed management method.

**Table 3-3: Waste Streams and Management**

Waste Stream	Management Method
Treated water	Treated water would be stored in the treated water storage tanks for testing to confirm it meets the criteria described in <b>Table 3-4</b> in <b>Section 3.6.2</b> . Treated water that meets these criteria would be discharged to the existing Smelter water management system or used as dust suppression.
Spent Filter Media	Spent filter media would be removed from the filter vessels using a vacuum tanker and transported to the onsite Containment Cell for placement in the cell. Any spent media generated following capping of the cell would be taken to an Environmental Protection Authority licensed facility for disposal.
Sludge	The sludge generated during the leachate treatment process would be transported to for placement in the Containment Cell. Any spent media generated following capping of the cell would be taken to an Environmental Protection Authority licensed facility for disposal.

The spent media would contain contaminants that are present within the Capped Waste Stockpile and other contaminated materials that will be placed in the Containment Cell. As the cell has been designed based on these contaminants the Containment Cell is designed to receive these wastes.

Waste generated during the construction and decommissioning of the Modification would be minimal. The TWTP would predominantly be modular with the majority of elements (apart from the consumables noted in Table 3-3) to be transported from the Project site for continued use. The other elements of the TWTS (the leachate storage and the transfer network) would either be disposed of to a licensed waste management facility (the HDPE pond lining and the HDPE pipe) or reused at the Project site (the excavated material used for the Leachate Holding Pond).

### **3.4 Quality control and assurance**

Condition A5 of the development consent for SSD 6666 requires Hydro to enter into a Voluntary Planning Agreement (VPA) with the Minister for Planning. Under the VPA (and also required by condition A8 of the development consent for SSD 6666) t, an Independent Engineer (IE) is to be commissioned.

The VPA and the IE Deed describes the responsibilities of the IE. These responsibilities include the inspection and verification of the Containment Cell Leachate Pond and the Leachate Holding Pond, which have been approved under the development consent for SSD 6666. The IE would issue a Certificate of Compliance for the stage of the remediation works that includes the leachate storage ponds.

### **3.5 Construction**

Construction for the Modification would be undertaken generally in the following stages:

- Site preparation
- Construction of the TWTS
- Testing and commissioning of the TWTP
- Construction demobilisation.

A description of each stage is included below.

#### **3.5.1 Site preparation**

Initial activities would be the establishment of environmental and safety controls. Environmental and safety controls for the construction of the TWTS would be consistent with that described in the EIS and the RtS including soil and water management and erosion and sediment controls.

The TWTP would be established at a location within 20 m of the edge of the Leachate Holding Pond. The plant would be modular and site preparation would be required prior to construction of the TWTP.

As noted in the EIS and RtS, the proposed location for the Leachate Holding Pond contains contaminated soils associated with the Anode Waste Pile that was previously in this location. The Anode Waste Pile is an area of environmental concern containing polycyclic aromatic hydrocarbon (PAH) contamination in surface soils to 0.2 m below ground surface. The extent and depth of contaminated material to be removed has been determined (966 m<sup>3</sup>). These materials would be removed and disposed of within the Containment Cell prior to construction of the Leachate Holding Pond and installation of the pipe connecting it to the TWTP. Remediation of this area forms part of the Project. The remediation would be validated prior to construction of the Leachate Holding Pond.

The existing Construction Environmental Management Plan (CEMP) would be updated to include any specific controls required for construction of the TWTS.

### **3.5.2 Construction of the Temporary Water Treatment System**

#### **3.5.2.1 Leachate storage construction**

The Containment Cell Leachate Pond and Leachate Holding Pond would be constructed utilising small to medium sized earthmoving equipment placed and compacted to specified requirements. They would be constructed using validated fill material sourced from the Smelter Site and lined with 2 mm HDPE lining to contain the leachate. The ponds would be constructed in accordance with the designs in **Appendix 2**, and forms part of the project approved by the development consent for SSD 6666.

The HDPE 2mm lining will be the same as that to be used in the Containment Cell construction. As noted in Appendix E (Liner Degradation Assessment) of the Containment Cell Detailed Design Report (GHD, 2018) that was presented as Appendix 3 to the Response to Submissions Report, this liner was selected following extensive testing using leachate extracted from the Capped Waste Stockpile. As the Containment Cell Leachate Pond and Leachate Holding Pond would store such leachate, the HDPE lining would be adequate for leachate storage.

Section 1.3 (Reliance) of the Containment Cell Detailed Design Report noted that GHD referenced the *Environmental Guidelines: Solid Waste Landfills* (EPA, 2018) in preparing the report (including the leachate storage design).

#### **3.5.2.2 Transfer pipe installation**

The transfer pipe would be constructed of 100 mm diameter HDPE piping and would be butt welded and surface laid. Where the pipeline is required to cross an access road it would be installed under the road. Where the pipe traverses the unnamed watercourse, it would be double skinned. The pipeline route (as shown in **Figure 3-2**) would be clearly delineated and sign posted.

#### **3.5.2.3 Temporary Water Treatment Plant construction**

All required components of the TWTP would be delivered to site and put in place using cranes and/or manatou. All pipework would be connected, and the electrical work would be completed by a licensed electrician.

The TWTP would be constructed inside a bund which would be designed to contain any spillage/leaks if they are to occur. The bund would contain a sump from which any collected water can be transferred to the head of the plant for treatment.

The TWTP would be constructed in accordance with the design in **Appendix 3**.

### **3.5.3 Testing and commissioning**

#### **3.5.3.1 Wet and dry commissioning**

Upon completion of construction of the TWTP (including all mechanical and electrical elements) commissioning of the TWTP would commence. The commissioning would dry test all drives, valves and instruments for correct functionality. Device sequencing would also be tested and verified. Inspection Test Plans (ITPs) and Inspection Test Reports (ITRs) would be used for verification.

Following completion of dry commissioning, wet commissioning of the system using clean water would be undertaken.

The transfer pipe would also be pressure tested prior to commissioning.

### **3.5.3.2 Process proving**

When the wet commissioning is complete, process proving process would commence. Process proving would include:

- Treatment of three batches of leachate (each batch would be approximately 20 kL)
- One sample of raw water (TWTP feed water) and treated water would be collected for each batch and analysed at a National Association of Testing Authorities (NATA) accredited laboratory
- If all three batch results consistently meet the discharge criteria, then the process proving period would complete and the plant would commence full operation.

### **3.5.4 Site demobilisation**

Following completion and commissioning of the TWTP, any disturbed areas would be reinstated and all construction infrastructure such as fencing and environmental controls would be removed.

### **3.5.5 Hours, duration and workforce**

Construction of the Modification would be undertaken during the hours described in the EIS:

- 7:00am to 6:00pm Monday to Friday
- 8:00am to 1:00pm Saturday
- No construction works on Sunday or public holidays

Construction activities would commence immediately following this modification be granted consent. Construction would take approximately six to eight weeks: construction of the Leachate Holding Pond would take approximately two weeks, and the TWTP would take approximately six to eight weeks. A peak workforce of approximately 18 construction personnel would be required.

Testing and Commissioning of the TWTP, including process proving, would take approximately six weeks. Approximately six personnel would be required during this stage including licensed electricians and plumbers.

### **3.5.6 Equipment and materials**

Plant and equipment to be used during the construction works would include:

- Excavators
- Dozers
- Rollers
- Trucks
- Handheld tools and equipment
- Mobile crane
- Telescopic handler (telehandler).

## **3.6 Operation**

### **3.6.1 Temporary Water Treatment Plant**

The TWTP would operate throughout Containment Cell base construction, material placement and capping of the Containment Cell. It is expected that the TWTP would primarily be in operation during and following rain events.

The TWTP would be inspected generally on a weekly basis whenever the TWTP is required to be operated, except during dry periods where there is no water to treat. The TWTP would be serviced as recommended by the manufacturer. In the event that the inspection identified potential operational issues, TWTP operation would be immediately suspended and serviced as soon as practicable.

### 3.6.2 Treated leachate testing and discharge

Following leachate treatment, treated water from the treated water holding tanks would be tested for suspended solids, pH, fluoride and hydrocarbons to a level suitable to be discharged to the Smelter water management system, or additionally treated as required to comply with discharge requirements. The treated water would be reused during the Project for dust suppression and/or discharged (as authorised under the Hydro EPL) from the North East Dam.

The TWTP plant has been designed based on the leachate collected from the Capped Waste Stockpile (refer to Section 3.1.1) and for the contaminants outlined in **Table 3-4**. Compliance with these limits would mean that the treated leachate would be consistent with the water in the North East Dam, and therefore what has been discharged (via irrigation) under the Smelter water management system for more than 25 years.

**Table 3-4: Treated Leachate Target Values**

Parameter	Units	Limit	Frequency of Testing
Conductivity	µS/cm	4,000 <sup>1</sup>	Prior to discharge of each batch
Fluoride	mg/L	15 <sup>2</sup>	
Free cyanide	mg/L	<0.005	
Total oils and grease	-	No visual sheen <sup>3</sup>	
pH	-	6.5-8	
Total Suspended Solids (TSS)	mg/L	<50 <sup>3</sup>	
Total Dissolved Solids (TDS)	mg/L	None specified	
Total polyaromatic hydrocarbons (PAHs)	µg/L	LOR (<1)	
Total Recoverable Hydrocarbons (TRH)	µg/L	LOR (<100)	

<sup>1</sup> Use Of Effluent By Irrigation, Department of Local Government, 1998

<sup>2</sup> Historical value of F in North Dams

<sup>3</sup> Managing Urban Stormwater: Soils and Construction, 2004

#### 3.6.2.1 North East Dam monitoring and management

Hydro continues to implement a long term surface water sampling program in accordance with its Soil and Water Management Plan (SWMP), which forms part of its Remediation Works Environmental Management Plan (RWEMP). This includes the North East Dam, other dams within the Project site, and upstream and downstream locations in adjoining waterbodies (including adjacent to the irrigation area). The monitoring includes the following:

- Monthly monitoring of all locations with analysis for pH, electrical conductivity, fluoride, free cyanide, TSS and TDS
- The monthly monitoring of the North East Dam will also include the additional parameters in **Table 3-5**.
- Weekly monitoring of the North East Dam and Eastern Surge Pond for pH and fluoride
- Monthly monitoring of all dams and ponds within the Project site for pH, electrical conductivity and fluoride
- Visual monitoring of the irrigation area

**Table 3-5: North East Dam Target Values**

Parameter	Units	Limit	Frequency of Testing
Conductivity	µS/cm	4,000 <sup>1</sup>	Weekly
pH	-	6.5-8 <sup>2</sup>	
Fluoride	mg/L	15 <sup>2</sup>	
Free cyanide	mg/L	<0.005	
Total oils and grease	-	No visual sheen <sup>3</sup>	
Total Dissolved Solids (TDS)	mg/L	None specified	Monthly or prior to irrigation
Total Suspended Solids (TSS)	mg/L	<50 <sup>3</sup>	
Total polyaromatic hydrocarbons (PAHs)	µg/L	LOR (<1)	
Total Recoverable Hydrocarbons (TRH)	µg/L	LOR (<100)	
Heavy metals:			
Aluminium	mg/L	20 <sup>4</sup>	
Arsenic III	mg/L	2 <sup>4</sup>	
Arsenic VI	mg/L	2 <sup>4</sup>	
Cadmium	mg/L	0.05 <sup>4</sup>	
Chromium III	mg/L	1 <sup>4</sup>	
Chromium VI	mg/L	1 <sup>4</sup>	
Copper	mg/L	5 <sup>4</sup>	
Lead	mg/L	5 <sup>4</sup>	
Nickel	mg/L	2 <sup>4</sup>	
Mercury (inorganic)	mg/L	0.002 <sup>4</sup>	
Zinc	mg/L	5 <sup>4</sup>	

<sup>1</sup> Use Of Effluent By Irrigation, Department of Local Government, 1998

<sup>2</sup> Historical value in North Dams

<sup>3</sup> Managing Urban Stormwater: Soils and Construction, 2004

<sup>4</sup> Short-term trigger values for heavy metals and metalloids in irrigation sourced from ANZECC, 2000.

This surface water monitoring is the continuation of monitoring that has been undertaken for more than 25 years, which has not identified significant adverse impacts from the historical use of the irrigation area.

### 3.6.3 Leachate storage safeguards

The TWTP is designed based on the modelled leachate generation for the site using peak rainfall conditions. However, additional leachate storage is incorporated in the waste cells themselves. The TWTP design includes two 1 ML leachate storage ponds. These are supplemented by in-cell holding capacity of 1ML at both the Containment Cell and the Capped Waste Stockpile.

The Detailed Design Report (GHD, 2018) estimated that the highest leachate generation rate would be 1.8ML/ month, resulting in more than two months of storage of untreated leachate available at this maximum rate. In the event of an extreme event, additional storage within the Containment Cell and Capped Waste Stockpile is available, however this would mean flooding of

waste within the Containment Cell. As such this would only be undertaken when this is required to avoid leachate overflowing from the dedicated storage areas.

The TWTP is designed to treat 2.4ML/ month and would therefore have sufficient capacity to avoid the need to use the Containment Cell and Capped Waste Stockpile themselves for storage.

If a significant rain event is forecast, the following would be implemented (as required) to maintain storage capacity:

- Continuous operation of the TWTP at its maximum available capacity
- Transport leachate for off site treatment as described in **Section 3.8**

#### **3.6.4 Hours, duration and workforce**

Remediation activities under condition B38 of SSD 6666 are permitted between the hours of:

- 7:00am to 6:00pm Monday to Friday
- 7:00am to 1:00pm Saturday.

Additionally, under condition B39 of SSD 6666, work outside these hours may occur in the following circumstances:

- Works that are inaudible at the nearest receivers
- Works agreed to in writing by the Planning Secretary
- Where it is required in an emergency to avoid the loss of lives, property or to prevent environmental harm.

No changes to the approved hours are required for the Modification. The TWTP would, however, have the ability to operate unmanned during the night-time via a programmable logic controller (PLC) and remote monitoring and control. Night-time operation of the TWTP would only be undertaken if heavy rain is forecast or occurring, and additional hours of treatment were required to restore leachate storage capacity.

In the event that night-time operation is required the noise sources would be a diesel generator and submersible pumps. This equipment is consistent with those identified in the Noise and Vibration Impact Assessment in the EIS that could operate (concurrently with numerous other equipment and machinery) outside standard construction hours without generating audible noise at the nearest sensitive receiver.

It is anticipated that operation of the TWTS would continue for a period of 24 months (until completion of the Containment Cell) or until no longer required.

### **3.7 Decommissioning**

The TWTS would be decommissioned upon completion of the Containment Cell and would involve the following:

- Dismantling of the TWTP. As noted in **Section 3.5.1** the TWTP would be modular
- Removal of the transfer pipeline connecting the TWTP to the Leachate Holding Pond
- Removal of the transfer pipeline connecting the Leachate Holding Pond to the Containment Cell Leachate Pond
- Removal of the Leachate Holding Pond. The pond lining would be removed and disposed of either within the Containment Cell or at a licensed facility. The material used to construct the pond (as described in **Section 3.5.2.1**) would be tested and analysed prior to excavation. It is expected that none of the leachate would have passed through the lining to impact on this material. As such, based on its current characteristics this material would be suitable for use within the Project Site

- The footprint of the Leachate Holding Pond would be formed consistent with the overall landform plan for the Site.

### 3.8 Offsite treatment – transport to licensed facility

Offsite treatment of leachate may also be considered where leachate volumes exceed the capacity of the onsite TWTP and the leachate storage capacity, such as following or during heavy rain events. It may also be needed if the TWTP was unavailable for maintenance

The leachate would be removed and transported to a licensed facility for treatment as described in the Response to Submissions.

### 3.9 Comparison of the Approved Project to the Modification

#### 3.9.1 Project components

**Table 3-6** provides a summary of the key components of the Modification and comparison to the approved Project under SSD 6666 as relevant. SSD 6666 will remain substantially the same if the Modification is approved.

**Table 3-6: Comparison of the Approved Project to the Modification**

Parameter	Approved Project	Proposed Modification
Project life	Four years (to 2021 - 2024)	No change
Disturbance Area	As shown on Figure 3-2 of the EIS	No change
Hours of operation	Monday to Friday 7:00am to 6:00pm Saturdays 7:00am to 1:00pm Outside these hours provided inaudible at nearest receivers	No change. The TWTP would have the ability to operate unmanned during the night-time via a PLC and remote monitoring and control if required (refer to <b>Section 3.5.5</b> ), and would be inaudible at nearest receivers
Equipment	<ul style="list-style-type: none"> <li>• Excavators</li> <li>• Graders</li> <li>• Compactors / Rollers</li> <li>• Dump trucks</li> <li>• Forty tonne articulated trucks</li> <li>• Scrapers / Dozers / Front end loaders</li> <li>• Backhoes</li> <li>• Vibrating drum roller</li> <li>• Water truck</li> <li>• Machinery service vehicle</li> <li>• Refuelling vehicles</li> <li>• Various hand operated equipment</li> <li>• Concrete crushing plant</li> <li>• Jackhammers</li> </ul>	<p>The TWTS key components (as described in <b>Table 3-4</b>) and equipment listed in <b>Section 3.5.6</b> including:</p> <ul style="list-style-type: none"> <li>• Excavators (no change)</li> <li>• Dozers (no change)</li> <li>• Rollers (no change)</li> <li>• Trucks (no change)</li> <li>• Handheld tools and equipment (no change)</li> <li>• Mobile crane</li> <li>• Telescopic handler (telehandler)</li> </ul>

Parameter	Approved Project	Proposed Modification
Leachate Management	<ul style="list-style-type: none"> <li>Offsite treatment of leachate at a licensed facility</li> <li>Option to construct an onsite TWTP, to be used in conjunction with offsite treatment</li> </ul>	<p>Confirmation of construction and use of an onsite TWTP and associated infrastructure (with the option of offsite treatment if required)</p> <p>Consistent with the proposed location presented in the RtS</p> <p>Offsite treatment of leachate at a licensed facility may still be required</p>
Water Management	<ul style="list-style-type: none"> <li>Water management system as shown on Figure 13-2 of the EIS</li> <li>Subsurface and open surface drainage throughout the Smelter</li> <li>Storage in the North East Dam and reused or irrigated to land north of the Site in accordance with the EPL</li> <li>Wastewater discharge via the existing Hunter Water sewerage system or collection by a licensed contractor for disposal</li> </ul>	<p>Discharge of treated water to the existing water management system following confirmation that relevant water quality criteria are met</p>

### 3.9.2 Development consent

A review of SSD 6666 was undertaken to:

- Consider compliance of the Modification with the existing conditions of consent
- Identify which conditions would require amendment to facilitate the Modification.

The Modification could be undertaken without changes to all but one condition (Condition A2) in the development consent for SSD 6666. The key conditions that would specifically apply to the Modification are described in Table 3-7.

**Table 3-7: Conditions of Consent Relevant to the Modification**

Condition No.	Condition Summary	Relevance
B5	Requirement for preparation of a Containment Cell Management Plan (CCMP)	The Modification would not impede the successful implementation of the CCMP
B10	Preparation of a Remediation Validation Report	The Modification would form part of the remediation works described in the report
B13, B14 and B15	Work health and safety requirements, including the need to prepare and implement a Health and Safety Plan (HSP)	Work health and safety requirements are to be implemented, and the HSP to be reviewed and amended to incorporate the Modification (if required)
B17	Requirement for an Erosion and Sediment Control Plan (ESCP)	An ESCP is to be prepared and implemented for construction of the Modification
B20	Traffic and access management	Vehicles importing materials and equipment for the Modification would comply with the Traffic Management Plan and Site Access Plan

Condition No.	Condition Summary	Relevance
B23 – B26	Waste management: statutory requirements	Any wastes from the TWTP are to be classified prior to placement in the Containment Cell or transported for off site management
B32	Avoidance of generation of offensive odour	The TWTP is designed and would be operated to avoid generation of offensive odours
B34 and B35	Hours of operation and requirements for works undertaken outside of standard construction hours	If the TWTP is required to operate outside of standard construction hours the requirements of Condition B35 would apply.
B44	Avoiding impacts from lighting	If the TWTP is required to operate at night time, it can do so unmanned. Therefore dedicated lighting is unlikely to be installed.
B47	Preparation of a Fire Safety Study and Construction Safety Study	The Modification would be incorporated into the plans and reports that have been prepared to address this requirement
B48	Emergency Plan and Safety Management System	The Modification would be incorporated into the plans and reports that have been prepared to address this requirement
B50	Safe storage of chemicals, fuels and oils	The TWTP would be located within a bunded area
C2	Requirement to prepare and implement the RWEMP	The RWEMP would apply to the Modification and would, where required, be amended to reflect the Modification

Table 3-8 identifies the existing conditions requiring amendment, and the proposed amendments.

**Table 3-8: Proposed Revisions to the Conditions of Consent**

Existing Condition	Proposed Revision/s
A2	N/A
The development may only be carried out:	
a) In compliance with the conditions of this consent;	No change
b) In accordance with all written directions of the Planning Secretary;	No change
c) In accordance with the EIS and Response to Submissions;	In accordance with the EIS, <del>and</del> Response to Submissions <b>and Modification 1</b>
d) In accordance with the Development Layout in Appendix 1; and	<b>Update figure in Appendix 1 to include the TWTS components shown in Figure 3-2</b>
e) In accordance with the management and mitigation measures in Appendix 2.	<b>Update Appendix 2 to include the additional management and mitigation measures described in Section 7 of this SEE</b>

### 3.9.3 Substantially the same project

The consent authority can grant consent for the Modification under Section 4.55(1A) of the EP&A Act if:

- (a) *it is satisfied that the proposed modification is of minimal environmental impact, and*
- (b) *it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which the consent was originally granted and before that consent as originally granted was modified (if at all)*

The Modification is considered to present a minimal environmental impact, and be substantially the same development to the approved under SSD 6666 as:

- As concluded by the assessment in **Section 6** the Modification would provide a net environmental benefit for the Project, with mitigation measures to be implemented to minimise potential environmental impacts from the Modification
- The overall nature and scale of the Project remains similar to that approved in the development consent for SSD 6666. In addition, the TWTP is identified in "Figure 1: Main Components of the Development" of Appendix 1 to the development consent. As such the Modification represents an accepted element of the Project
- The majority of the Project remains unchanged to that approved.

The only element of the Project that changes is which form of leachate management is the primary option (on site over off site treatment). As discussed in Section 1.1 the option of on site leachate treatment was described in both the EIS and the RtS. Only one condition (and three sub-conditions), one figure and one appendix to the development consent for SSD 6666 would require minor modifications.

### 3.10 Assessment of alternatives

The following options for leachate treatment were considered for the Project:

- Option 1: Onsite treatment
- Option 2: Offsite treatment with the option of onsite treatment if required
- Option 3: Primary onsite treatment with the option of offsite treatment if required.

#### 3.10.1 Option 1: Onsite treatment

Onsite treatment of leachate was proposed as the leachate treatment method in the EIS. It was selected as it provides greater certainty regarding leachate management. Hydro and its Remediation Contractor would have direct control over the management of leachate, avoiding any potential issues that may occur at offsite treatment facilities.

#### 3.10.2 Option 2: Offsite treatment with optional of onsite treatment

Offsite treatment of leachate with the option of onsite treatment if required, was proposed as the preferred method of treatment in the RtS. This was proposed as a review undertaken during development of the detailed design indicated that offsite treatment was the most cost-effective option and did not present an unacceptable environmental risk.

However on further review (as described in **Section 3.10.3**) it was concluded that having offsite treatment as the primary leachate management measure was not preferable based on economic, logistics and environmental factors.

#### 3.10.3 Option 3: Primary onsite treatment with optional offsite treatment

Following preparation of the RtS the leachate management strategy was revisited. A combination of onsite and offsite treatment, with a priority for onsite treatment, is the preferred treatment strategy for the following reasons:

- Cost savings: additional review of the leachate management options identified that onsite treatment was more cost efficient than of site treatment.
- Reduced truck movements to/from the Site. Onsite treatment would remove approximately 120 truck movements per month (based on treating 2,400 kL/ month and 20 kL/tanker load)
- Increased security and environmental protection. Onsite treatment would allow Hydro to maintain sufficient leachate storage capacity at the Project site without dependency on the availability and capacity of the offsite treatment facilities.
- Increase flexibility and efficiencies in leachate treatment.

### **3.11 Need for and Justification of the Modification**

Modelling of leachate generation within the Containment Cell prior to and following capping of the cell was undertaken as part of the *Containment Cell Detailed Design Report* prepared by GHD (2018) (Appendix 3C of the RtS). The modelling indicated that annual leachate generation is predicted to peak at approximately 1,948 kL per month during material placement, through to 3,884 kL in the first year following capping, before reducing to 388 L per year after five years of capping.

The EIS and RtS both included onsite leachate treatment as a management option. The RtS noted that offsite treatment was preferred with optional onsite treatment. The RtS states: *"In the event that Hydro decides to proceed with construction and operation of an onsite leachate treatment plant, Hydro would submit a detailed design for review and approval by the Department and the EPA."* (pg. 28).

Since preparation of the RtS, Hydro has undertaken further review of the environmental and economic factors associated with onsite versus offsite treatment methods of leachate and has determined that onsite treatment is preferred. The benefits are:

- Onsite treatment provides greater certainty regarding leachate management. Hydro and its Remediation Contractor would have direct control over the management of leachate, avoiding any potential issues that may occur at offsite treatment facilities
- It would provide a treatment plant technology specifically designed, constructed and operated for the chemical and physical characteristics of the leachate generated at the Smelter
- Onsite treatment is more cost effective than transporting for offsite treatment.

Offsite treatment would be retained as a potential leachate treatment option: it would, however, only be used when needed due to excessive leachate generation (actual or predicted), or if the onsite treatment plant was unavailable for maintenance.

The Modification is required to:

- Include onsite leachate treatment as the preferred approach to leachate management
- To provide the Department and the Environmental Protection Authority with sufficient information on the design, construction, operation and decommissioning of the TWTS so that the potential environmental issues and associated management measures can be understood, and that it can be appropriately regulated as part of the Project.

## 4. PLANNING AND STATUTORY SETTING

### 4.1 Local Planning

#### 4.1.1 Cessnock Local Environment Plan

The Site is zoned under 'RU2 Rural Landscape' under the *Cessnock Local Environmental Plan 2011* (Cessnock LEP). The purpose of the RU2 Rural Landscape zone is to protect rural land and facilitate rural and agricultural activities. This zoning does not reflect the industrial land uses that has occurred at the Site since 1969. The Smelter has relied on existing use rights under the EP&A Act to carry out its operations (including obtaining development consent to expand the Smelter in 1993 and 2002).

Development for the purposes of 'waste disposal facility' is permissible with consent in the RU2 Rural Landscape zone. The Cessnock LEP defines a 'waste and resource management facility' as: *"a building or place used for the disposal of waste by landfill, incineration or other means, including such works or activities as recycling, resource recovery and other resource management activities, energy generation from gases, leachate management, odour control and the winning of extractive material to generate a void for disposal of waste or to cover waste after its disposal"*. The TWTP is defined as a waste disposal facility and is permissible with consent under the Cessnock LEP.

The Modification is an alteration to the existing development consent and does not change the intended land use. Therefore, the proposed modification is permitted under section 4.55(1A) of the EP&A Act.

### 4.2 State Matters

#### 4.2.1 NSW Environmental Planning and Assessment Act 1979

The EP&A Act is the principal piece of environmental legislation which provides for development planning and control in NSW. Approval for the Smelter was granted under Part 4 of the EP&A Act. Section 4.55 of the EP&A Act addresses the modification of development consents.

Section 4.55(2) of the EP&A Act allows for a development consent to be modified by the consent authority to which the original application was made, provided the modification is *"substantially the same development"* for which the consent was originally granted. As discussed in Section 3.9 the Modification is substantially the same development to that approved under SSD 6666.

Section 4.15(1) of the EP&A Act stipulates the issues to be considered for a modification application by a consent authority as follows:

##### ***"(1) Matters for consideration—general***

*In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:*

*(a) the provisions of:*

- (i) any environmental planning instrument, and*
- (ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and*
- (iii) any development control plan, and*

- (iia) any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and  
 (iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph),  
 (v) (Repealed)

that apply to the land to which the development application relates,

- (b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,  
 (c) the suitability of the site for the development,  
 (d) any submissions made in accordance with this Act or the regulations,  
 (e) the public interest.”

This SEE addresses the relevant requirements of section 4.15(1) of the EP&A Act.

#### 4.2.2 NSW Environmental Planning and Assessment Regulation 2000

In addition to the requirements under the EP&A Act, Clause 115 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) prescribes the information that must be lodged with a section 4.55 application.

**Table 4-1** lists the information required to be lodged with a section 4.55 application and where each has been included in this SEE.

**Table 4-1: Required Information for a Modification Application**

Information Required	SEE Section
(a) the name and address of the applicant,	<b>Section 1.3</b>
(b) a description of the development to be carried out under the consent (as previously modified),	<b>Section 2</b>
(c) the address, and formal particulars of title, of the land on which the development is to be carried out,	<b>Section 1.3</b>
(d) a description of the proposed modification to the development consent,	<b>Section 2</b>
(e) a statement that indicates either:	<b>Section 1.2</b>
(i) that the modification is merely intended to correct a minor error, misdescription or miscalculation, or	
(ii) that the modification is intended to have some other effect, as specified in the statement,	
(f) a description of the expected impacts of the modification,	<b>Section 6</b>
(g) an undertaking to the effect that the development (as to be modified) will remain substantially the same as the development that was originally approved.	<b>Section 4.2.1</b>
(g1) in the case of an application that is accompanied by a biodiversity development assessment report, the reasonable steps taken to obtain the like-for-like biodiversity credits required to be retired under the report to offset the residual impacts on biodiversity values if different biodiversity credits are proposed to be used as offsets in accordance with the variation rules under the Biodiversity Conservation Act 2016,	Not required
(h) if the applicant is not the owner of the land, a statement signed by the owner of the land to the effect that the owner consents to the making of the application (except where the application for the consent the subject of the modification was made, or could have been made, without the consent of the owner),	Not required

Information Required	SEE Section
(i) a statement as to whether the application is being made to the Court (under section 4.55) or to the consent authority (under section 4.56),  and, if the consent authority so requires, must be in the form approved by that authority.	<b>Section 1.2</b>

Under clause 118(2) of the EP&A Regulation, Hydro is required to publish a notice of the Modification application on the website of the consent authority. The notice must include:

- a) a brief description of the development consent, the land to which it relates and the details of the modification sought
- b) a statement that written submissions concerning the proposed modification may be made to the consent authority that publishes the notice within the period specified in accordance with paragraph (c),
- c) the minimum period specified in clause 10 of Schedule 1 to the Act
- d) a statement that, if the application is approved, there is no right of appeal to the Court by an objector.

The minimum period specified in clause 10 of Schedule 1 to the Act in relation to (c) above is 14 days.

#### **4.2.3 NSW Protection of the Environment Operations Act 1997**

The *NSW Protection of the Environment Operations Act 1997* (POEO Act) requires any person carrying out scheduled work to obtain an EPL that authorises that work to be carried out at the premises.

Hydro has an Environment Protection Licence (EPL) No. 1548 issued under the POEO Act. "Chemical storage waste generation" is the scheduled activity, which relates to chemical storage at a scale greater than 100 T annual volume of waste generated or stored. Activities associated with the Modification would be undertaken in accordance with the EPL.

Hydro has submitted application for a variation to No. 1548 to include "Contaminated soil treatment" as a scheduled activity. Hydro has consulted with the EPA during their consideration of the application, with consideration of the proposed TWTP.

Relevant conditions of the EPL relating to the Modification are summarised in **Table 4-2**.

**Table 4-2: Relevant EPL conditions**

Condition	Relevance to the Modification
P1.2	Authorises water discharge to the Irrigation area
L1.1	The licensee must comply with section 120 of the POEO Act (pollution of waterways)
O2	All plant and equipment installed at the premises or used in connection with the licensed activity must be maintained and operated in a proper and efficient manner
O3	Prescribes conditions relating to minimisation of dust generation and emissions
O5	The licensee must ensure that any liquid and/or non-liquid waste generated and/or stored and/or processed at the premises is assessed and classified in accordance with the Environmental Protection Authority's Waste Classification Guidelines
O6.2	The licensee must ensure that hazardous or restricted solid waste is stored or contained in a secure manner so as to prevent any hazard and the escape of waste and/or leachate
R2	The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act
E1.1	The licensee is to continue operating the groundwater interception trench and leachate management system for the CWS

Due to the expected quantity of leachate treatment, the plant's capacity and that it is only treating leachate generated on site, the Modification would not trigger additional schedule activities listed in Schedule 1 of the POEO Act.

#### 4.2.4 Other key NSW legislation

**Table 4-3** identifies the key requirements of other NSW environmental legislation and its relevance to the Modification.

**Table 4-3: Other Relevant NSW Legislation**

Legislation	Relevance to the Modification
<i>Biodiversity Conservation Act 2016</i> (BC Act)	The purpose of the BC Act is to conserve and protect biodiversity. Consideration of biodiversity impacts is included in <b>Section 6.8</b> . The Modification is located within the previously disturbed area subject to the development consent for SSD 6666 and does not require any additional vegetation clearance. The Modification therefore would not result in any direct impacts to biodiversity.
<i>Contaminated Land Management Act 1997</i> (CLM Act)	Section 60 of the CLM Act requires landowners to notify the Environmental Protection Authority if their activities have resulted in contamination of the land. Hydro has previously consulted with the Environmental Protection Authority and the Environmental Protection Authority has determined that the Site does not warrant regulation under the Act. The Modification would not change this determination.

Legislation	Relevance to the Modification
<i>National Parks and Wildlife Act 1974</i> (NP&W Act)	<p>The NPW Act is the primary legislation for the management and protection of Aboriginal relics and sites. Consideration of heritage impacts is included in <b>Section 6.9</b>. There are no registered AHMIS sites located within the disturbance footprint of the Modification as assessed in the Aboriginal Heritage Assessment undertaken by AECOM as part of the EIS.</p> <p>Additionally, the Modification is located on previously disturbed land and therefore is unlikely to result in any direct impacts to Aboriginal heritage.</p>
<i>Heritage Act 1977</i> (Heritage Act)	<p>The Heritage Act is the primary legislation for the management and protection of non-indigenous heritage.</p> <p>Consideration of heritage impacts is included in <b>Section 6.9</b>. Modification is located on previously disturbed land and therefore is unlikely to result in any direct impacts to heritage. Requirements under the Heritage Act would apply to any unexpected finds if encountered.</p>
<i>Water Management Act 2000</i> (WM Act)	<p>The licensing and approvals provisions of the WM Act apply (in general terms) to water sources that are subject to a Water Sharing Plan (WSP).</p> <p>The Modification does not involve the extraction or capture of any additional water at the Site and therefore a Water Access Licence under section 60A or an aquifer interference approval under section 91 is not required.</p> <p>In any event, under section 5.23 of the EP&amp;A Act, a water use approval (section 89), water management work approval (section 90) or a controlled activity approval (section 91) under the WM Act is not required for approved SSD.</p>
<i>Roads Act 1993</i> (Roads Act)	<p>Section 138 of the Roads Act requires that a person obtain the consent of the appropriate roads authority for the erection of a structure, or the carrying out of a work in, on or over a public road, or the digging up or disturbance of the surface of a public road.</p> <p>The Modification does not involve work in, over or disturbance of a public road and therefore no approvals are required under the Roads Act. The traffic impacts associated with the Modification are discussed in <b>Section 6.5</b>.</p>
<i>Waste Avoidance and Resource Recovery Act 2001</i> (WARR Act)	<p>The WARR Act establishes a hierarchy of waste management (avoid, recover, dispose) encouraging efficient use of resources and minimising waste. Waste materials generated as a result of the Modification would be managed in accordance with the principles of the waste management hierarchy referred to in the WARR Act. A discussion on waste management for the Modification is in <b>Section 6.7</b>.</p>
<i>Protection of the Environment Operations (Waste) Regulation 2014</i> (POEO Regulation)	<p>The POEO Regulation describes the regulatory processes for waste management in accordance with the POEO Act. A discussion on waste management for the Modification is in <b>Section 6.7</b>.</p>

#### 4.2.5 State Environmental Planning Policies

**Table 4-4** provides a summary of the relevant State Environmental Planning Policies (SEPPs) considered for the Modification.

**Table 4-4: Relevant State Environmental Planning Policies**

Instrument	Relevance to the Modification
<i>State Environmental Planning Policy (State and Regional Development) 2011 (SEPP S&amp;RD)</i>	The Project was approved as a SSD as it was determined to be a 'waste and resource facility' under schedule 1 of the S&RD SEPP. The Modification would form part of the approved Project.
<i>State Environmental Planning Policy No 33 - Hazardous and Offensive Development (SEPP 33)</i>	<p>SEPP 33 requires the consent authority to consider whether an industrial proposal is a 'potentially hazardous industry' or a 'potentially offensive industry'. A Preliminary Hazards Analysis (PHA) is required for potentially hazardous developments to assist the consent authority to determine acceptability. SSD 6666 was defined as a potentially hazardous development and a PHA was prepared as part of the EIS.</p> <p><i>Applying SEPP 33 (DoP, 2011)</i>, provides guidance as to when a project should be considered to be 'potentially hazardous industry' or a 'potentially offensive industry' including for modifications. <i>Applying SEPP 33 (DoP, 2011)</i> states: "If the proposed use or modifications are considered potentially hazardous or potentially offensive in their own right, then SEPP 33 applies... SEPP 33 would also apply if the proposed modifications are not potentially hazardous in themselves, but interact with the existing facility in a way that cumulative hazards (or offence) from the existing facility may be significantly increased".</p> <p>The PHA prepared for the EIS considered an onsite leachate treatment system when determining that the Risk Level for the Project was medium.</p> <p>No dangerous goods, as classified by the Australian Dangerous Goods Code (<i>Australian Code for the Transport of Dangerous Goods by Road &amp; Rail</i>), would be handled at the TWTP in quantities that could result in significant offsite impacts.</p> <p>The Modification therefore is not considered to be potentially hazardous in its own right, nor would it change the conclusion of the PHA that considered onsite leachate treatment.</p>

#### 4.3 Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the core piece of legislation protecting Matters of National Environmental Significance (MNES) and Commonwealth land. There are nine MNES identified under the EPBC Act:

- World Heritage Properties
- National Heritage Places
- Wetlands of international importance
- Listed threatened species and ecological communities
- Migratory species
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions
- A water resource, in relation to coal seam gas development and large coal mining development.

Under the EPBC Act, a referral is required to be submitted to the Commonwealth Department of Agriculture, Water and the Environment for any 'action' that is considered likely to have a significant impact on any MNES. If the Department of Agriculture, Water and the Environment determines the action to be a 'controlled activity' approval is required from the Minister of the Environment.

The Smelter was previously referred under the EPBC Act and was deemed not a controlled action on 29 March 2016. As discussed in Section 5 the Modification would not result in a significant impact on MNES. Therefore, a referral to the Department of Agriculture, Water and the Environment for the Modification is not required.

## 5. STAKEHOLDER CONSULTATION

**Table 5-1** provides a summary of the stakeholder consultation undertaken for the Modification and any issues or comments raised.

Copies of the correspondence referred to in **Table 5-1** are provided in Appendix 4.

**Table 5-1: Summary of Consultation undertaken for the Modification**

Stakeholder	Method of Consultation	Date	Issues / Comments
Department of Planning, Industry and Environment (DPIE)	Request for SEARs	27 January 2021	Refer to Section 2.1
Environment Protection Authority (EPA)	Letter	25 January 2021 (to EPA)	Refer to Section 2.2
	DPIE request for input to SEARs (with copy of first draft SEE)	3 February 2021	
	EPA response to DPIE	23 February 2021	
	Site Meeting	29 March 2021	
	Letter and revised draft SEE	10 May 2021 (to EPA)	
	Emails	10 May 2021 (to and from EPA)	Submission of the letter and revised draft SEE EPA acknowledgement of receipt
	Telephone conversation	19 May 2021	Advice from EPA for Hydro to submit final SEE for EPA to complete formal review of final SEE
	Email	19 May 2021 (from EPA)	
Cessnock City Council	DPIE request for input to SEARs	3 February 2021	
	Council response to DPIE	11 February 2021	No issues
DPIE (Water)	DPIE request for input to SEARs	3 February 2021	
	DPIE (Water) response to DPIE	8 February 2021	Refer to Section 2.2
	Email	4 June 2021 (to DPI (Water))	DPIE Water will only comment on the final SEE forwarded by DPIE
Community Reference Group	Bi-Monthly Meeting	18 February 2021	No comments

## 6. ASSESSMENT OF ENVIRONMENTAL EFFECTS

### 6.1 Soil and Water

#### 6.1.1 Background

##### 6.1.1.1 Topography

The Site is relatively flat at approximately 16 m Australian Height Datum (AHD) with a gentle slope from west to east and south to north. The Site increases in elevation to the west which is at an elevation of 25 m AHD.

##### 6.1.1.2 Hydrological context

The Site is located in the Hunter catchment. Watercourses proximate to the Site are shown on **Figure 1-1**. Wentworth Swamp is the main water feature on the Hydro Land. Swamp Creek, Black Waterholes Creek and several smaller tributaries are tributaries of Wentworth Swamp. Swamp Creek flows in a northerly direction in the east of the Hydro Land, while Black Waterholes Creek flows in a northerly direction in the northwest of the Hydro Land. Both creeks flow into the Wentworth Swamp discharging to Wallis Creek, which then flows into the Hunter River. Swamp Creek is approximately 180 m to the east of the south-east corner of the Site.

An unnamed watercourse is located approximately 45 m to the west of the Site. This unnamed watercourse is a tributary to Black Waterholes Creek. Other small ephemeral watercourses and low-lying areas are located to the east of the Site and drain to Swamp Creek.

The Site is located above the 1% Annual Exceedance Probability (AEP) flood level of 9.7 m AHD and the Probable Maximum Flood (PMF) level of 12.2 m AHD (apart from small areas in the west of the Site) (Ramboll 2015).

##### 6.1.1.3 Surface water management

The existing surface water management system includes:

- Subsurface and open surface water drainage throughout the Site
- Three surge ponds located each in the west, east and south of the Site
- North East Dam (as described in **Section 1.6**).

Concentrations of fluoride and cyanide and pH level are routinely monitored in the North East Dam. Concentrations measured in 2015 show:

- Fluoride below 21 mg/L
- Conductivity below 810 uS/cm
- pH between 6.9 and 8.0 pH units.

Hydro undertakes a surface water monitoring program that encompasses the creek systems of Wentworth Swamp, ephemeral ponds within the Hydro Land and catchment dams located between 2 km and 7 km from the Site. Upstream and downstream locations are monitored monthly for pH, conductivity, fluoride, suspended solids and total dissolved solids, with several locations also monitored for free cyanide.

A water balance model was produced (refer to Appendix X of the RtS) which found that the Site is capable of containing and controlling stormwater runoff for up to a 1 in 5-year, 3-hour storm event (PCB 2019).

#### **6.1.1.4 Contamination**

Several contamination investigations have been undertaken at the Site since operations ceased in 2012 (described in detail in the EIS). The proposed location for the Leachate Holding Pond was identified as containing contaminated soils (refer to Figure 8-8 of the EIS). Soils in these locations are proposed to be excavated prior to construction of the Leachate Holding Pond and disposed of within the Containment Cell.

#### **6.1.1.5 Groundwater**

Groundwater ranges between 1 m and 5 m below ground surface (bgs) in the estuarine sands in the eastern portion of the site. The shallow groundwater travels north and northeast towards the Wentworth Swamps.

The Modification does not require any infrastructure that would require earthworks to a depth that would intercept groundwater.

As discussed in Section 3.1.2.3 the Leachate Holding Pond has been designed: to avoid interception of groundwater; and using materials (in particular the HDPE liner selected following extensive testing using leachate from the Capped Waste Stockpile) that would minimise the potential for impacts to groundwater.

#### **6.1.2 Impact assessment**

Construction activities associated with the Modification have the potential to result in:

- Compaction of soil structure from heavy vehicles and machinery. However, this impact would be minimal as vehicles and machinery movements would be restricted to designated haul road, other access roads and previously disturbed areas.
- Erosion and sedimentation (and associated impacts on water quality) from activities such as:
  - Ground disturbance activities during construction
  - Vehicular movements. As noted above, this impact would be minimal as vehicle movements would be restricted to designated haul roads and previously disturbed areas.
  - Stockpiling of materials.
- Low level of pollution of the unnamed watercourse if sediments generated from construction activities or are not contained within the Site by using appropriate environmental controls.

Additionally, potential sources of soil and water contamination from the Modification may include:

- The transfer pipeline from the Containment Cell Leachate Pond being damaged and leaking leachate. As discussed in **Section 3.5.2.2** the pipeline would be clearly delineated and sign posted, minimising the potential for damage. It would also be double lined where it crosses the unnamed watercourse
- Malfunction or damage to the TWTP resulting in leaking leachate. As discussed in **Section 3.5.2.3** the impact of any leak would be controlled by the TWTP bund
- Hydrocarbon spills from vehicles and machinery
- Accidental spills of any other chemicals, fuels, and/or waste.

As discussed in **Section 6.1.1.5** the TWTP and associated infrastructure would be constructed and operated to avoid impacts to groundwater quality. As such The Modification would not pose a risk groundwater dependent ecosystems or licensed groundwater users.

As discussed in **Section 3.6.2** the TWTP has been designed and would be operated to treat the leachate so the treated effluent is largely consistent with the water quality in the North East Dam,

and therefore what has been discharged (via the irrigation area) for more than 25 years without adverse effects.

### 6.1.3 Management and mitigation measures

**Table 6-3** summarises the relevant mitigation measures from the EIS and the additional measures to be implemented for the Modification in relation to soils and water.

**Table 6-1: Soils and Water and Leachate Management Mitigation Measures**

Relevant Mitigation Measures from the EIS
<ul style="list-style-type: none"> <li>• Surface water and groundwater monitoring would continue to be conducted consistent with the existing or updated EPL</li> <li>• The surface water drainage system would be inspected and maintained as required on a monthly basis</li> <li>• All Project personnel would be informed during the site induction of their obligations to minimise erosion and protect water quality</li> <li>• Erosion and sediment controls would be inspected and maintained as required on a weekly basis and after a rain event</li> <li>• Vehicles exiting the Project Site onto public roads would be inspected for mud and dirt. If required vehicles would be manually cleaned prior to exiting the Project Site</li> <li>• Vehicle refuelling would be undertaken using mobile refuelling vehicles equipped with spill containment equipment and a spill kit</li> <li>• All chemicals onsite would be stored in accordance with the applicable Safety Data Sheet</li> <li>• An appropriate spill kit is to be onsite at all times and any spillage is to be immediately cleaned up. In the event of a large or hazardous spill, the fire brigade, police, ambulance and OEH would be contacted as appropriate</li> </ul>
Additional Mitigation Measures
<ul style="list-style-type: none"> <li>• The TWTP will be constructed inside a bund designed to contain any spillage/leaks if they are to occur.</li> <li>• The TWTP would be inspected generally on a weekly basis whenever the TWTP is required to be operated, except during dry periods where there is no water to treat.</li> <li>• The Containment Cell Leachate Pond transfer pipe would be inspected on a weekly basis. And damage observed during the inspection would be immediately repaired.</li> <li>• The TWTP would be serviced as recommended by the manufacturer. In the event that the inspection identified potential operational issues, TWTP operation would be immediately suspended and serviced as soon as practicable.</li> <li>• Treated leachate will be tested against the target values in <b>Table 3-4</b> prior to discharge. Treated leachate will not be discharged if an exceedance of any of the criteria occurred.</li> <li>• In the event that the two storage dams are at capacity and the four tanks in the TWTP are also full, leachate water will be pumped back into the Containment Cell.</li> </ul>

## 6.2 Hazards and Risks

### 6.2.1 Background

As discussed in **Section 1.5** the construction and operation of an onsite leachate treatment plant was part of the Project that was subject to the PHA prepared for the EIS. The PHA identified potential exposure to contaminated groundwater and leachate as a potential hazard.

As noted in Section 14.2.3 of the EIS *The Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* (Department of Planning, 2011) identifies "Water/ Sewage treatment" as a potentially hazardous industry, with "Chemical spills, Mixing of incompatibles" the potential hazard source and "Exposure to toxic liquids and gases" being the possible impact.

The PHA did conclude that with a **major** consequence and a **rare** likelihood, the risk level of the Works phase of the Project (which includes operation of the TWTP) according to *AS4360: Risk Management* is **medium**. Medium level risks can be managed with the standard measures described in the EIS.

### 6.2.2 Impact assessment

The potential hazards identified in the PHA relevant to the Modification are the:

- Potential for fire or explosion if oils, fuels and chemicals are incorrectly transported, stored or handled
- Potential for exposure to leachate (inhalation, ingestion or skin contact) if incorrectly handled
- Failure of the TWTS leading to uncontrolled discharge of leachate resulting in pollution of the unnamed watercourse and adjacent soils.

These potential hazards were included in the PHA and therefore the risk level for the Project remains unchanged (**medium**).

### 6.2.3 Management and mitigation measures

**Table 6-3** summarises the relevant mitigation measures from the EIS and the additional measures to be implemented for the Modification in relation to hazards and risks.

**Table 6-2: Hazards and Risks Mitigation Measures**

Relevant Mitigation Measures from the EIS
<ul style="list-style-type: none"> <li>• Implementation of the Work Health and Safety Management Plan.</li> <li>• Oils, fuels and chemicals stored in accordance with the applicable Safety Data Sheet.</li> <li>• Provision of spill kits.</li> </ul>
Additional Mitigation Measures
<ul style="list-style-type: none"> <li>• The TWTP would be inspected generally on a weekly basis whenever the TWTP is required to be operated, except during dry periods where there is no water to treat.</li> <li>• The TWTP would be serviced as recommended by the manufacturer. In the event that the inspection identified potential operational issues, TWTP operation would be immediately suspended and serviced as soon as practicable.</li> </ul>

## 6.3 Air Quality and Odour

### 6.3.1 Background

#### 6.3.1.1 Climate

The Site generally experiences a dominant southeast flow, with notable southwest and northwest components at 10 m above ground level (AGL). At 30 m AGL, the dominant wind direction is less defined from the southeast, with more even distribution between the east to southwest. This means that dust and odour emissions are generally carried to the northwest, northeast or southeast.

Weather data was obtained from the Bureau of Meteorology (BoM) Automatic Weather Station (AWS) at Cessnock Nulkaba station (Station Number 061242) located approximately 12 km west-southwest of the Site. Peak temperature occurs during summer months (between November and February) with a mean maximum temperature of 24.6°C. The lowest temperatures are usually experienced between June and August with a mean minimum temperature of 11.3°C.

The region is characterised by moderate rainfall, with a mean annual rainfall of approximately 763 mm, and an annual rainfall range between 467 mm and 1,096 mm. Rainfall is most pronounced between November and March, with significantly lower rainfall during the colder months of the year. An average of 80 rain days occur per year.

On average, the region experiences an annual evaporation rate of 1,350 mm/year, with greatest evaporation rates occurring during the summer months.

#### **6.3.1.2 Sensitive receivers**

The Site is approximately 600 m to the north of the nearest sensitive receiver. The next nearest is approximately 750 m to the southeast. There are approximately 16 rural residences within 1 km of the Site, of which 7 are on Hydro Land (several of the Hydro-owned residences have been demolished since preparation of the EIS).

Other sensitive receptors in proximity to the Site include the Kurri Kurri TAFE, located approximately 1.5 km to the southeast, and the Kurri Kurri High School, approximately 1.9 km to the southeast.

#### **6.3.1.3 Cumulative sources in the locality**

Air quality in the area may be influenced by various air emission sources including:

- Open-cut and underground coal mining operations situated to the southeast and northwest
- Mobile sources, such as emissions from road and rail transport, in particular the Hunter Expressway to the immediate south of the Project
- Emissions from light industrial, commercial and residential activity
- Wind entrained dust from exposed areas
- Biogenic (natural) sources, including the contribution of sea salt to airborne aerosol concentrations
- More remote sources which contribute episodically to suspended particulates in the region including dust storms and bushfires.

#### **6.3.1.4 Air quality criteria**

Air quality modelling was undertaken for the Project as part of the EIS. In summary, the modelling indicates that at all the sensitive receiver locations assessed the predicted incremental and cumulative concentrations and deposition rates are below the applicable Environmental Protection Authority assessment criteria and National Environment Protection Measure (NEPM) advisory reporting goals.

#### **6.3.2 Impact assessment**

During construction activities, the following air quality impacts may occur:

- Generation of diesel combustion related pollutants ( $\text{NO}_2$ ,  $\text{SO}_2$ , CO, polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs))
- Dust generation from vehicle movements on paved and unpaved roads
- Handling, transfer and storage of materials causing dust emissions
- Dust generation during excavation for construction of the TWTS.

These impacts are consistent with the approved Project and would be appropriately managed following the mitigation measures described in the EIS.

Additionally, during operations there may be odour emissions generated from the TWTP and the treated leachate evaporation process.

### 6.3.3 Management and mitigation measures

**Table 6-3** summarises the relevant mitigation measures from the EIS and the additional measures to be implemented for the Modification in relation to air quality and odour.

**Table 6-3: Air Quality and Odour Mitigation Measures**

Relevant Mitigation Measures from the EIS
<ul style="list-style-type: none"> <li>All Project personnel would be informed during the site induction of their obligations to minimise potential air quality and dust impact generation and the need to take reasonable and practical measures to minimise impacts.</li> <li>Maintain the five dust deposition monitoring locations around the Project Site established under the Stage 1 Demolition Air Quality Management Plan.</li> <li>Watering of the demolition areas and unsealed access roads.</li> <li>Wherever practicable, vehicles would use existing sealed roads.</li> <li>Speed limits would be imposed on internal roads in accordance with the Smelter Access Plan.</li> <li>Where possible construction vehicles and machinery would be turned off or throttled down when not in use.</li> <li>Construction vehicles and machinery would be maintained in accordance with manufacturer's requirements.</li> <li>Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.</li> <li>Record any exceptional incidents that cause dust and/ or air emissions, either on or offsite, and the action taken to resolve the situation in a log book.</li> <li>Carry out regular Project Site inspections to monitor compliance with the AQMP, record inspection results, and make an inspection log available to the Environmental Protection Authority and/or CCC upon request.</li> <li>Keep Project Site fencing, barriers and scaffolding clean using wet methods.</li> <li>Provide and maintain an adequate water supply on the Project Site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.</li> <li>Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.</li> <li>Vehicles entering and leaving the Project Site carrying potentially dust generating materials would be covered to prevent escape of materials during transport.</li> <li>Internal haul routes would be inspected for integrity and, where required, instigate necessary repairs to the surface as soon as reasonably practicable.</li> </ul>
Additional Mitigation Measures
<ul style="list-style-type: none"> <li>No additional measures required.</li> </ul>

## 6.4 Noise and Vibration

### 6.4.1 Background

#### 6.4.1.1 Sensitive receivers

**Section 6.3.1.2** provides context on the sensitive receptors in proximity to the Site. The Site is approximately 600 m to the north of the nearest sensitive receiver. The next nearest is approximately 750 m to the southeast.

#### 6.4.1.2 Cumulative sources in the locality

Attended monitoring undertaken for the EIS identified a number of influences on the local noise environment, including:

- Traffic noise from the Hunter Expressway and Main Road-Cessnock Road
- Construction noise from new housing land at Cliftleigh and Gilleston Heights and at the Hunter TAFE
- Industrial activities (such as metal fabrication business)
- Occasional air traffic
- Sounds typical of the rural and bushland environment (such as agricultural activities and animal sounds).

#### 6.4.1.3 Noise limits

As discussed in **Section 3.5.5**, works are permitted between the hours of 7:00am to 6:00pm Monday to Friday and 7:00am to 1:00pm on Saturday. Construction activities for the Modification would be undertaken within these hours.

Works are permitted outside these hours under the following circumstances:

- Works that are inaudible at the nearest receivers
- Works agreed to in writing by the Planning Secretary
- Where it is required in an emergency to avoid the loss of lives, property or to prevent environmental harm.

The onsite TWTP (and associated equipment, such as generators and mobile lighting) may be required to continue operating beyond standard construction hours prior to, during or following large storm events during the Containment Cell construction. This would allow the management of the additional leachate that may be generated as a result of the storm event and maintain the onsite leachate storage capacity.

Noise limits were determined for the Project in accordance with the *Interim Construction Noise Guideline* (DECC 2009) (ICNG). Noise levels at all of the noise sensitive receivers were predicted to comply with the highly affected noise criteria during standard construction hours and outside standard construction hours.

#### 6.4.2 Impact assessment

During construction activities noise and vibration impacts may result from vehicles including heavy vehicles and reversing alarms within the Site, and vehicles delivering or unloading equipment and materials to the Site. These impacts are considered consistent with the approved Project and would be appropriately managed following the mitigation measures described in the EIS.

The TWTP would be fully enclosed and therefore has low noise emissions. The main noise source from operation of the TWTP is the blower located outside of the building.

The noise impacts from the Modification would be required to comply with the noise limits specified in the construction noise management levels detailed in the ICNG.

Vibration impacts may result from vehicle movements and construction activities and are immaterial in comparison to the demolition activities approved for the Project. These impacts would be managed in accordance with *German Standard DIN 4150 Part 3 Structural Vibration in Buildings* and within the acceptable vibration values set out in *Environmental Noise Management Assessing Vibration: A Technical Guideline* (DECC, 2006).

#### 6.4.3 Management and mitigation measures

**Table 6-4** summarises the relevant mitigation measures from the EIS and the additional measures to be implemented for the Modification in relation to noise and vibration.

**Table 6-4: Noise and Vibration Mitigation Measures**

Relevant Mitigation Measures from the EIS
<ul style="list-style-type: none"> <li>• Local residents would be notified in advance of the Project of the nature and estimated timescales for completion of the Project. Thereafter ongoing notifications and updates on new or changes to Project activities would be provided in accordance with the Stakeholder Engagement Plan.</li> <li>• A 24-hour telephone number would be provided as a contact point for any complaints, issues or general enquiries regarding the Project.</li> </ul>

**Relevant Mitigation Measures from the EIS**

- All personnel would be informed of their obligations to minimise potential noise impacts during the site induction and the need to take reasonable and practical measures to minimise noise.
- Truck drivers are to be informed of site access routes, acceptable delivery hours and must minimise extended periods of engine idling.
- Vehicles and machinery would be selected with consideration of noise emissions. Where possible the sound power level of equipment and plant would comply with the sound power levels listed in the Noise and Vibration Impact Assessment in Appendix D (of the EIS) or it should be replaced with less noise intensive equipment.
- Activities that would generate an audible noise at sensitive receptors would be limited to occur between 7:00 am to 6:00 pm Mondays to Fridays and 7:00 am to 1:00 pm on Saturdays.
- Machines found to produce excessive noise compared to typical noise levels should be removed and replaced, or repaired or modified prior to recommencing Project.
- Where possible construction vehicles and machinery would be turned off or throttled down when not in use.
- Equipment would be inspected and maintained in accordance with manufacturer's requirements.
- Use less noise-intensive equipment where reasonable and feasible.
- Equipment with the most effective mufflers, enclosures and low-noise tool bits and blades must be procured and utilised where practicable for the Project.
- Avoid unnecessary revving of engines and turn off plant that is not being used / required where practicable.
- Use only non-tonal reverse alarms (broadband alternatives are needed). Where possible organise the site so that delivery trucks and haulage trucks only drive forward to avoid the use of reversing alarms.
- Where practical fixed plant should be positioned as far away as possible from sensitive receptors.
- Upon receiving a noise complaint regarding demolition activities, the following steps would be undertaken:
  - The person nominated in the Stakeholder Engagement Plan would investigate the source of the complaint. The aim would be to initiate an investigation no later than two hours after the complaint has been made (dependent on the nature of the complaint).
  - Where practicable a visit would be made to the complainant to verify the nature of the complaint
  - Where justified, appropriate action would be taken to amend the activity causing the complaint
  - Where three or more substantiated complaints of a similar nature are received (from at least two complainants), the work element must be reviewed in order to consider whether the work methods can be changed or if additional mitigation methods can be employed in order to prevent or reduce the likelihood of further complaints being made.
  - Attended monitoring should also be undertaken in response to substantiated complaints in order to validate and assess the source(s) giving rise to complaint(s).
  - Attended monitoring would be undertaken every three months to assess compliance with the relevant noise limits.

**Additional Mitigation Measures**

- No additional measures required.

**6.5 Transport and Access****6.5.1 Background**

The Hunter Expressway is part of the National Highway Network and is a major road in the Lower Hunter Region. The Hunter Expressway passes through to the south-west of the Site on Hydro owned land, with an interchange located on Hart Road. The northern end of Hart Road intersects with Dickson Road to provide access to the eastern parts of the Hydro Land.

John Renshaw Drive is a state road that connects with the Hunter Expressway south of the Site and forms part of the primary route (along with the New England Highway, Pacific Highway and Industrial Drive) to the Port of Newcastle and associated industrial areas.

Main Road-Cessnock Road is connected with the M15 Hunter Expressway via Kurri Kurri Interchange and passes through the Kurri Kurri town centre. It is an arterial route connecting Maitland and Cessnock via Gillieston Heights, Cliftleigh, Heddon Greta, Kurri Kurri, Weston and Abermain.

Site access for the Modification will be via Hart Road. Hart Road is undivided road with one lane in each direction and a post speed limit of 70 km/h.

### 6.5.2 Impact assessment

Traffic movements for the Modification would be for the:

- Delivery and removal of construction materials and the modular TWTP: approximately 15 truck movements over approximately three days
- Delivery and removal of construction equipment and machinery: approximately 15 truck movements over approximately three days
- Light vehicle movements by construction personnel: a maximum of 18 vehicles per day over the eight-week construction period
- Light vehicle movements by TWTS operation personnel and support vehicles: typically, no more than two vehicle movement per day.

These movements would generally be along Hart Road and Dickson Road via the Hunter Expressway. It is anticipated that the construction personnel trips would primarily be inbound in morning periods and outbound in afternoon/evening periods, while the heavy vehicle activity would occur over the course of the day.

The Modification would result in a significant reduction in the number of truck movements required to transport leachate for off site treatment. Table 9-1 of the RtS estimated eight to nine truck movements per week during remediation works. Truck movements would only be generated when off site treatment is required when the TWTP cannot be used as it requires maintenance, and/ or there is a need to increase leachate storage capacity (in advance of a predicted extreme rain event).

### 6.5.3 Management and mitigation measures

**Table 6-5** summarises the relevant mitigation measures from the EIS and the additional measures to be implemented for the Modification in relation to transport and access.

**Table 6-5: Transport and Access Mitigation Measures**

Relevant Mitigation Measures from the EIS
<ul style="list-style-type: none"> <li>• All personnel required to drive on the Project Site would be informed during the site induction of the access restrictions during the Project.</li> <li>• The initial internal access restrictions and alternative access routes would be established for the initial Project phase.</li> <li>• The initial internal access restrictions and alternative access routes would be altered as required to reflect the progression of the Project.</li> <li>• Speed limits would be imposed on internal roads in accordance with the Smelter Access Plan.</li> </ul>
Additional Mitigation Measures
<ul style="list-style-type: none"> <li>• No additional measures required.</li> </ul>

## 6.6 Visual

### 6.6.1 Background

The Hydro Land surrounding the Site includes bushland, grazing land, rural residences and recreational facilities.

The established residential townships of Kurri Kurri, Weston and Heddon Greta are located to the south of the Site, while the growing residential areas of Gillieston Heights and Cliftleigh are located to the north-east and east respectively. Other areas to the north, east and west are predominantly rural and rural-residential land uses.

Immediately south of the Hydro Land in the northern area of Kurri Kurri is an industrial estate that includes a number of small to medium industrial operations. The Kurri Kurri TAFE is located approximately 1.5 km to the southeast of the Site and Kurri Kurri High School is approximately 1.9 km to the southeast of the Site.

Open-cut and underground coal mining operations are situated to the southeast and northwest of the Site, including the Bloomfield Open Cut, Donaldson Open Cut, Abel Underground and Tasman Underground mines located at a distance between 7 km and 12 km away.

The Smelter is not visible from many directions due to the surrounding native vegetation and the local topography. Since completion of demolition of most structures the Smelter site is less visible.

### 6.6.2 Impact assessment

The visual impact of the Modification would be consistent with the remaining Smelter infrastructure and as such is not expected to negatively affect the visual character of the existing landscape. Further the infrastructure is temporary as it would be removed following completion of the Containment Cell.

The TWTP would be fitted with mobile lighting should operation of the TWTP be required at night. This lighting would be mounted, screened and directed in such a manner that it does not create a nuisance to residences or the public road network. With these arrangements, the potential impacts from lighting to receptors would be minimal.

### 6.6.3 Management and mitigation measures

**Table 6-6** summarises the relevant mitigation measures from the EIS and the additional measures to be implemented for the Modification in relation to visual impacts.

**Table 6-6: Visual Mitigation Measures**

Relevant Mitigation Measures from the EIS
<ul style="list-style-type: none"> <li>All personnel would be informed during the site induction of requirement to maintain the Project Site in an orderly condition.</li> <li>Under the Stakeholder Engagement Plan the local community would be advised of Project activities, including those with the potential for visual impacts.</li> </ul>
Additional Mitigation Measures
<ul style="list-style-type: none"> <li>Mobile lighting installed on the TWTP would be consistent with AS 4282(INT) - Control of Obtrusive Effects of Outdoor Lighting and would be mounted, screened and directed in such a manner that it does not create a nuisance to surrounding properties or the public road network.</li> </ul>

## 6.7 Waste

### 6.7.1 Background

Construction would generate various wastes that would be managed in accordance with the Environmental Protection Authority's *Waste Classification Guideline* (2014). Waste sources generated by the Modification would largely be from construction activities and may include:

- Construction waste such as concrete, timber, and steel and construction material packaging
- General domestic wastes such as food scraps, aluminium cans, glass bottles, plastic and paper containers and putrescible waste generated by site construction personnel.

Waste generated during the construction and decommissioning of the Modification would be minimal. The TWTP would predominantly be modular with the majority of elements (apart from the consumables noted in Table 3-3) to be transported from the Project site for continued use. The other elements of the TWTS (the leachate storage and the transfer network) would either be disposed of to a licensed waste management facility (the HDPE pond lining and the HDPE pipe) or reused at the Project site (the excavated material used for the Leachate Holding Pond).

As discussed in **Section 6.1.1.4** the contaminated material within the footprint of the Leachate Storage Pond and the TWTP would be removed, and the completion of remediation validated, prior to their construction.

The waste streams generated from the operation and maintenance of the TWTP would be:

- Spent media (GAC, IX resin, zeolite, sand): These wastes would be disposed of: within the Containment Cell once used/saturated; and at an off site licensed waste facility once the cell is capped.
- Sludge: the sludge would be pumped to a geotube for de watering and disposed of within the Containment Cell; and at an off site licensed waste facility once the cell is capped.
- Consumables (IBC, Carboys, containers): Generally, carboys and IBC would be returned to the supplier for reuse.

### 6.7.2 Impact assessment

The following key environmental impacts were identified for the Modification in relation to waste:

- Improper storage of wastes could lead to soil or water contamination, cause litter, odour or encourage pests/wildlife

These impacts are considered consistent with the approved Project. The various waste streams and disposal options have been considered as part of the Modification and can be appropriately managed.

### 6.7.3 Management and mitigation measures

**Table 6-7** summarises the relevant mitigation measures from the EIS and the additional measures to be implemented for the Modification in relation to waste.

**Table 6-7: Waste Mitigation Measures**

Relevant Mitigation Measures from the EIS
<ul style="list-style-type: none"> <li>• All Project personnel would be informed during the site induction of the waste management hierarchy and the measures to be implemented.</li> <li>• Promotion of efficient resource use, waste avoidance and waste minimisation.</li> <li>• Compounds and the stockpile area would be maintained in an organised condition, with waste materials to be transported to and stockpiled in the designated storage area.</li> <li>• Wastes would be managed to minimise the potential for windblown wastes spreading within or beyond the Project Site, including into watercourses.</li> <li>• Implementation of the materials tracking system described in Section 7.5.4 of the EIS.</li> <li>• Where possible recyclable wastes generated at the contractor's compound (paper, cans and bottles) would be collected by a recycling contractor. Remaining wastes would be collected for disposal at a licensed waste management facility.</li> <li>• Waste removal contractors transporting material from the Project Site would be required to provide dockets to confirm that waste was transported to a licensed waste management facility.</li> <li>• The environmental controls and containment measures placed on waste stockpiles would be inspected and maintained as required on a weekly basis and after rain and strong wind events.</li> </ul>

Relevant Mitigation Measures from the EIS
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<b>Additional Mitigation Measures</b> <ul style="list-style-type: none"> <li>Spent media (GAC, IX resin, zeolite, sand) wastes would be disposed of within the Containment Cell once used/saturated. If they cannot be disposed of within the Containment Cell (such as being generated following the capping of the Containment Cell) they would be sampled and analysed as per the Environmental Protection Authority Waste Classification Guidelines and disposed of at a facility licenced to accept them.</li> <li>Sludge would be pumped to a geotube for de watering then disposed of within the Containment Cell. If it cannot be disposed of within the Containment Cell, sludge would be sampled and analysed as per the Environmental Protection Authority Waste Classification Guidelines, then disposed of at a facility licenced to accept it.</li> <li>Consumables (IBC, Carboys, containers) would generally be returned to the supplier for reuse. Where this is not possible, they will be recycled.</li> </ul>
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## 6.8 Biodiversity

### 6.8.1 Background

The Site is previously disturbed by the Smelter operations and therefore does not contain any endangered ecological communities or threatened vegetation.

Ten threatened and six listed migratory fauna species were detected within the Hydro Land during the ecological assessment undertaken for the EIS. Two threatened fauna species (Squirrel Glider and Little Lorikeet) were also recorded within the Site.

### 6.8.2 Impact assessment

The Modification is located on previously disturbed land within the Site boundary. Therefore, no direct impacts to biodiversity are expected to result from the Modification.

Indirect impacts to native fauna may result from noise, dust and lighting emissions generated during construction activities. These impacts are considered negligible in comparison to the approved Project.

### 6.8.3 Management and mitigation measures

**Table 6-8** summarises the relevant mitigation measures from the EIS and the additional measures to be implemented for the Modification in relation to biodiversity.

**Table 6-8: Biodiversity Mitigation Measures**

Relevant Mitigation Measures from the EIS
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- |   |
|---|
| <ul style="list-style-type: none"> <li>Appropriate hybrid grass species (that cannot become weed issues in adjoining native vegetation) would be used in stabilising surfaces following completion of the Works.</li> </ul> |
|---|

<b>Additional Mitigation Measures</b> <ul style="list-style-type: none"> <li>No additional measures required.</li> </ul>
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## 6.9 Heritage

### 6.9.1 Background

An Aboriginal Heritage Assessment was undertaken by AECOM as part of the EIS. The areas associated with the Modification were characterised as having low to nil heritage sensitivity. No Aboriginal heritage sites have been recorded within the disturbance area of the Modification.

No heritage items of local or state significance have been identified within the Site boundary.

### 6.9.2 Impact assessment

Due to the absence of known heritage items within or in proximity to the Site, and the highly disturbed nature of the Site there is a low risk of Aboriginal heritage items to be present.

There are no additional potential impacts in comparison with the approved Project.

### 6.9.3 Management and mitigation measures

**Table 6-9** summarises the relevant mitigation measures from the EIS and the additional measures to be implemented for the Modification in relation to heritage.

**Table 6-9: Heritage Mitigation Measures**

Relevant Mitigation Measures from the EIS
<ul style="list-style-type: none"> <li>All personnel required to undertake earthworks within the Project Site outside of the Smelter would be informed during the site induction of Aboriginal cultural heritage issues.</li> <li>An unexpected finds procedure would be implemented in the event that a potential Aboriginal site was identified during the Works. This procedure would include: <ol style="list-style-type: none"> <li>1) All works would cease immediately in the area to prevent any further impacts to the site.</li> <li>2) Notify the Works' Environment Officer.</li> <li>3) Engage a suitably qualified archaeologist and RAP representative to determine the nature, extent and significance of the Aboriginal site and provide appropriate management advice. Management action(s) would vary according to the type of evidence identified, its significance (both scientific and cultural) and the nature of potential impacts.</li> <li>4) Prepare and submit an AHIMS site card for the Aboriginal site.</li> </ol> </li> <li>A standard procedure would be implemented for the management of any potential human skeletal remains identified throughout the Works. This procedure would include: <ol style="list-style-type: none"> <li>1) All work in the vicinity of the remains should cease immediately.</li> <li>2) The location should be cordoned off and the appropriate authorities notified.</li> <li>3) A physical or forensic anthropologist should be commissioned to inspect the remains in situ and make a determination of ancestry (Aboriginal or non-Aboriginal) and antiquity (pre-contact, historic or modern). Following completion of task three, the applicable action/s listed below would be implemented: <ul style="list-style-type: none"> <li>- If the remains are identified as non-human, work can recommence immediately.</li> <li>- If the remains are identified as modern and human, the area would become a crime scene under the jurisdiction of the NSW Police.</li> <li>- If the remains are identified as pre-contact or historic Aboriginal, the site would be secured and OEH and all RAPs notified in writing. Where impacts to exposed Aboriginal skeletal remains cannot be avoided, remains would be retrieved via controlled archaeological excavation and reburied outside of the Disturbance Boundary in a manner and location determined by RAPs.</li> <li>- If the remains are identified as historic non-Aboriginal, the site would be secured and the NSW Heritage Branch contacted.</li> </ul> </li> </ol> </li> </ul>
Additional Mitigation Measures
<ul style="list-style-type: none"> <li>No additional measures required.</li> </ul>

## 7. ADDITIONAL MANAGEMENT AND MITIGATION MEASURES SUMMARY

**Table 7-1** lists the management and mitigation measures proposed for the Modification.

The Remediation Works Environmental Management Plan would be revised to incorporate the additional management and mitigation measures identified in **Section 6** to specifically address construction and operation of the Modification.

**Table 7-1: Summary of Management and Mitigation Measures**

Area	Management / Mitigation Measures	Timing
General	The TWTP would be serviced as recommended by the manufacturer. In the event that the inspection identified potential operational issues, TWTP operation would be immediately suspended and serviced as soon as practicable.	Operation
	The TWTP would be inspected generally on a weekly basis whenever the TWTP is required to be operated, except during dry periods where there is no water to treat.	Operation
Soil and water	The TWTP will be constructed inside a bund designed to contain any spillage/leaks if they are to occur.	Construction and operation
	The Containment Cell Leachate Pond transfer pipe would be inspected on a weekly basis. And damage observed during the inspection would be immediately repaired.	Operation
	Treated leachate will be tested against the target values in Table 2 3 prior to discharge. Treated leachate will not be discharged if an exceedance of any of the criteria occurred.	Operation
	In the event that the two storage dams are at capacity and the four tanks in the TWTP are also full, leachate water will be pumped back into the Containment Cell.	Operation
Visual	Mobile lighting installed on the TWTP would be consistent with AS 4282(INT) - Control of Obtrusive Effects of Outdoor Lighting and would be mounted, screened and directed in such a manner that it does not create a nuisance to surrounding properties or the public road network.	Operation
Waste	Spent media (GAC, IX resin, zeolite, sand) wastes would be disposed of within the Containment Cell once used/saturated. If they cannot be disposed of within the Containment Cell (such as being generated following the capping pf the Containment Cell) they would be sampled and analysed as per the Environmental Protection Authority Waste Classification Guidelines, then disposed of at a facility licenced to accept them.	Operation
	Sludge would be pumped to a geotube for de watering then disposed of within the Containment Cell. If it cannot be disposed of within the Containment Cell, sludge would be sampled and analysed as per the Environmental Protection Authority <i>Waste Classification Guidelines</i> and disposed of at a facility licenced to accept it.	Operation
	Consumables (IBC, Carboys, containers) would generally be returned to the supplier for reuse. Where this is not possible, they will be recycled.	Operation

## 8. CONCLUSION AND JUSTIFICATION

Since preparation of the Response to Submissions, Hydro has undertaken further review of the environmental and economic factors associated with onsite versus offsite treatment methods of leachate during construction of the Containment Cell and has determined that onsite treatment is preferred. The benefits are:

- Onsite treatment provides greater certainty regarding leachate management. Hydro and its Remediation Contractor would have direct control over the management of leachate, avoiding any potential issues that may occur at offsite treatment facilities
- It would provide a treatment plant technology specifically designed, constructed and operated for the chemical and physical characteristics of the leachate generated at the Smelter
- Onsite treatment is more cost effective than transporting for offsite treatment.

Offsite treatment would be retained as a potential leachate treatment option: it would, however, only be used when needed due to excessive leachate generation (actual or predicted), or if the onsite treatment plant was unavailable for maintenance.

A modification to the development consent for SSD 6666 is required to include onsite leachate treatment as the preferred approach to leachate management.

This Modification Application has been prepared in accordance with section 4.55 of the EP&A Act. It is concluded that, in accordance with section 4.55(1A) the modification would:

- 
- Be substantially the same development following the modification
- In accordance with section 4.55(3), the relevant provisions of section 4.15(1) of the EP&A Act have been considered and adequately addressed in this Modification Application.

It is requested that the existing approval of SSD 6666 be modified by DPE under Section 4.55 of the EP&A Act.

## 9. REFERENCES

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Vipac Engineers & Scientists. 2016. *Hydro Aluminium Kurri Kurri Ltd Demolition and Remediation: Noise and Vibration Impact Assessment*.

## 10. LIMITATIONS

Ramboll Australia Pty Ltd (Ramboll) prepared this report in accordance with the scope of work as outlined in our proposal to Hydro Aluminium Kurri Kurri Pty Ltd dated 3 May 2019 and in accordance with our understanding and interpretation of current regulatory standards.

Site conditions may change over time. This report is based on conditions encountered at the site at the time of the report and Ramboll disclaims responsibility for any changes that may have occurred after this time.

The conclusions presented in this report represent Ramboll's professional judgment based on information made available during the course of this assignment and are true and correct to the best of Ramboll's knowledge as at the date of the assessment.

Ramboll did not independently verify all of the written or oral information provided to Ramboll during the course of this investigation. While Ramboll has no reason to doubt the accuracy of the information provided to it, the report is complete and accurate only to the extent that the information provided to Ramboll was itself complete and accurate.

This report does not purport to give legal advice. This advice can only be given by qualified legal advisors.

### 10.1 User Reliance

This report has been prepared exclusively for Hydro Aluminium Kurri Kurri Pty Ltd and may not be relied upon by any other person or entity without Ramboll's express written permission.

## **APPENDIX 1**

### **LEACHATE MANAGEMENT PLAN**

Intended for

**Hydro Aluminium Kurri Kurri Pty Ltd**

Document type

**Report**

Date

**December, 2020**

# **KURRI KURRI ALUMINIUM SMELTER DECOMMISSIONING, DEMOLITION AND REMEDIATION LEACHATE MANAGEMENT PLAN**

# KURRI KURRI ALUMINIUM SMELTER DECOMMISSIONING AND DEMOLITION LEACHATE MANAGEMENT PLAN

Ref	<b>318000533</b>
Document ID	<b>Hydro Kurri Kurri SWMP_Appendix 1_FINAL Leachate Management Plan_20201223</b>
Revision	<b>Final</b>
Made by	<b>C Whitehill</b>
Checked by	<b>S Taylor</b>
Approved by	<b>F Robinson</b>
Description	<b>Ramboll was engaged by Hydro Aluminium Kurri Kurri Pty Ltd to prepare an Environmental Management Plan (EMP) to describe how environmental management will be undertaken at the former Hydro Aluminium Kurri Kurri aluminium smelter at Hart Road Loxford, NSW and the surrounding land owned by Hydro. This Leachate Management Plan (LMP) forms a component of the SWMP.</b>

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## ACRONYMS AND ABBREVIATIONS

AEP	Annual Exceedance Probability
EC	Electrical Conductivity
EMP	Environmental Management Plan
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
F	Fluoride
Hydro	Hydro Aluminium Kurri Kurri Pty Ltd
LMP	Leachate Management Plan
SSD	State Significant Development
SWMP	Soil and Water Management Plan
TDS	Total Dissolved Solids
Total CN	Total Cyanide
TSS	Total Suspended Solids
TWTP	Temporary Water Treatment Plant
WHS	Workplace Health and Safety

## GLOSSARY

Council	Cessnock City Council
Hydro	Hydro Aluminium Kurri Kurri Pty Ltd
Hydro Land	The land owned by Hydro Aluminium Kurri Kurri Pty Ltd which includes the Smelter and surrounding land.
Remediation	Remediation of contaminated land and soils at the Smelter and on Hydro Land, including the construction of a Containment Cell as addressed in the State Significant Development application to the Department of Planning and Environment SSD 6666.
Stage 1 Demolition	Demolition of Smelter buildings addressed in the development application to Cessnock City Council 8/2015/399/1.
Stage 2 Demolition	Demolition of Smelter buildings, three concrete stacks, a water tower, subsurface structures to 1.5m below ground surface and operation of a concrete crushing plant addressed in the development application to Cessnock City Council 8/2018/46/1.
The Smelter	The former Hydro Aluminium Kurri Kurri Pty Ltd aluminium smelter at Hart Road, Loxford.

# 1. INTRODUCTION

## 1.1 Background

This Leachate Management Plan (LMP) has been prepared by Ramboll Australia Pty Ltd on behalf of Hydro Aluminium Kurri Kurri Pty Ltd (Hydro) to support the Soil and Water Management Plan (SWMP) and the Environmental Management Plan (EMP) for the decommissioning, demolition and remediation activities at the former Hydro Aluminium Kurri Kurri Smelter (the Smelter) at Hart Road Loxford and the management of the surrounding land owned by Hydro (the Hydro Land).

## 1.2 Objectives

The objectives of this LMP are to:

- Detail how leachate from the Containment Cell, Capped Waste Stockpile and the Dickson Road Landfill will be managed to protect water quality within and surrounding the Smelter during the material removal and the placement of material in the Containment Cell.
- Provide a program to monitor leachate generation and quality
- Provide a mechanism to assess performance against the relevant assessment criteria.
- Detail the requirement for reporting exceedances of assessment criteria.
- Establish the roles and responsibilities of all parties involved in leachate management.
- Establish supervision, monitoring and reporting framework for the LMP.

## 1.3 Purpose and Scope

The purpose of the LMP is to:

- Specify procedures for leachate management during remediation of the Capped Waste Stockpile and other contaminated areas, and the placement of material into the Containment Cell
- Satisfy the relevant conditions of the Development Consent for State Significant Development (SSD) 6666 relating to remediation activities and specifically leachate management.

The LMP reflects the design and operational procedures of the Containment Cell leachate collection and management system detailed in the *Containment Cell Detailed Design Report* (GHD, 2018) and measures described in the *Response to Submissions Report: Former Hydro Aluminium Kurri Kurri Smelter Remediation* (Ramboll, 2020) (the RtS).

## 1.4 Regulatory Requirements

### 1.4.1 Development Consent

The development consent for SSD 6666 does not include specific conditions relating to leachate management. However as required by condition A2, leachate management will be undertaken in accordance with the Environmental Impact Statement (EIS) and the RtS. This LMP has been prepared to describe how the leachate management measures described in the EIS and RtS will be implemented.

### 1.4.2 Environmental Protection Licence

The *Protection of the Environment Operations Act 1997* (POEO Act) requires any person carrying out scheduled work (as described in Schedule 1 of the POEO Act) to obtain an environment protection licence (EPL) that authorises that work to be carried out at the premises.

Hydro holds Environment Protection Licence (EPL) No. 1548 for the Smelter operations. The EPL contains conditions relating to the groundwater interception trench and leachate management system association with the Capped Waste Stockpile. A list of the EPL conditions related to leachate management and where they are addressed in this document are outlined in **Table 1-1**.

**Table 1-1: Relevant EPL Conditions**

<b>No.</b>	<b>Condition</b>	<b>Location in LMP</b>
L1	Pollution of waters	<b>Section 2</b>
O5	Processes and management	<b>Section 0</b>
M1	Monitoring records	<b>Section 4.1</b>
R1	Annual return documents	<b>Section 4.1</b>
E1	Groundwater interception and monitoring - Capped Waste Stockpile	<b>Section 2.3</b> and <b>Section 4.1.3</b>

In addition, the plan aims to comply with the following legislation and guidelines:

- *Environmental Planning and Assessment Act 1979*
- *Protection of the Environment Operations Act 1997*
- *Protection of the Environment Operations (Waste) Regulation 2014*
- *Water Management Act 2000*
- *Water Act 2012*
- *National Water Quality Management Strategy: Australian Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000)
- *Managing Urban Stormwater – Soils and Construction, Volume 1* (Landcom, 2004)
- *Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination* (DEC, 2007)

## 2. EXISTING ENVIRONMENT AND POTENTIAL IMPACTS

### 2.1 Groundwater

Groundwater within the Smelter site has been impacted by Smelter activities primarily due to leaching of fluoride and aluminium from smelter materials into groundwater.

Groundwater immediately down gradient of the Capped Waste Stockpile has been impacted by leachate generated from contact of wastes in the Capped Waste Stockpile with shallow groundwater and from the infiltration of water through the Capped Waste Stockpile (prior to capping). The leachate plume extends approximately 350m north east of the eastern toe of the Capped Waste Stockpile and is characterised by elevated fluoride, cyanide and sodium concentrations and by a high pH.

A groundwater interception trench was constructed to intercept leachate impacted water from the Capped Waste Stockpile in order to mitigate potential off-site environmental impacts.

The groundwater interception trench was constructed with the following objectives:

- To intercept leachate impacted shallow, perched groundwater when it rises towards the ground surface (during high rainfall conditions); and
- Dispose of the captured water via the existing Smelter water management system.

The groundwater interception trench performance monitoring and reporting requirements are discussed in **Section 4**.

Groundwater interception during remediation will be limited to the excavation of the Capped Waste Stockpile and demolition works below 1.5m bgs. Construction of the Containment Cell is not expected to intercept groundwater with the base of excavation of the Containment Cell to be between one to three metres above the underlying aquifer however, management of groundwater is required during the initial phases of material emplacement as detailed within the SWMP.

Groundwater encountered in the Capped Waste Stockpile will be extracted using sumps or extraction wells within the Capped Waste Stockpile and either removed for treatment by a licenced waste contractor (**Section 2.3.4.3**) or treated through an on site temporary water treatment plant (**Section 2.3.4.2**) prior to discharge through the Smelter water management system.

Impacts to natural soils beneath the Capped Waste Stockpile have occurred to depths of less than 1.0m below the waste/natural soil interface. Excavation of these soils for relocation to the Containment Cell will also be required. Treatment of groundwater from this excavation will also be undertaken by draining groundwater to a sump. Where groundwater within the excavation is treated (removed), remediation of groundwater will be considered complete.

### 2.2 Surface Water

The Smelter has an existing stormwater and surface water management system. This includes:

- Subsurface and open surface water drainage throughout the Smelter.
- One dam in the west of the Smelter, one in the northeast of the Smelter and one on the southeast of the Smelter. These are the initial collection and treatment points for the water.
- Two dams located to the north of the Smelter. These have previously been used as part of the water collection and treatment system for the Smelter. These continue to capture surface water runoff from the Smelter, receiving water that has passed through the south, east and west surge ponds.
- Irrigation area. To the north of the Smelter is an irrigation area that receives water from the North Dams. The irrigation area is operated in accordance with the requirements of the EPL.

Surface water management of the Smelter site will be focused on the separation of clean stormwater from water that comes into contact with contaminated soils, waste or leachate. Clean stormwater will be directed into the Smelter water management system for dust suppression throughout the demolition and remediation activities. Water that comes into contact with any material from the Capped Waste Stockpile, waste in the Containment Cell or Dickson Road landfill will be classified as leachate and require collection and disposal and/or treatment as described in **Section 2.3.4**.

A stormwater diversion drain will be installed around the perimeter of the Containment Cell (including the perimeter access track) to divert clean water around the Containment Cell and reduce the amount of water requiring treatment.

The Containment Cell will be constructed with four initial internal cells, separated by internal bunds. Material will be placed within one internal cell at a time. This will allow any rain collected within unfilled cells to be managed as clean water; only water within the filled cell will need to be managed as leachate as per **Section 2.3.4**.

## **2.3 Leachate**

Leachate will result from the remediation of the Capped Waste Stockpile and Dickson Road South, and from waste material emplacement into the Containment Cell. The Detailed Design Report (GHD, 2018) has estimated approximately 12,720kL of leachate will be generated and require treatment.

### **2.3.1 Capped Waste Stockpile**

The Capped Waste Stockpile will require continued collection and treatment of the existing leachate as well as any stormwater collected within the exposed stockpile during remediation. Any water that comes in contact with leachate will be classified as leachate and treated accordingly. The remediation of the Capped Waste Stockpile will be staged to minimise the surface area of waste exposed to rainfall.

The area of the Capped Waste Stockpile uncovered at any time will be minimised. This will allow water from the remaining capped area to be diverted away from the exposed material and managed as clean water; only the water from the exposed material will need to be considered and managed as leachate.

Leachate within the Capped Waste Stockpile will be drained to a sump and either transported offsite or treated onsite as described in **Section 2.3.4**. Treatment will continue until the contents of the Capped Waste Stockpile are removed from the area.

### **2.3.2 Containment Cell**

As stated in **Section 2.2**, waste material emplacement within the Containment Cell will occur as a staged process within four internal cells, separated by internal bunds. Each cell will contain a water collection/ sump system to enable the removal of leachate and/ or clean water for treatment or discharge into the Smelter water management system respectively.

Leachate within the Containment Cell will be drained to two sumps and either transported offsite or treated onsite as described in **Section 2.3.4**.

### **2.3.3 Dickson Road South**

Remediation of the Dickson Road South site will require removal of the perched groundwater. The *Remedial Action Plan: Dickson Road South, Kurri Kurri, NSW* (Ramboll, 2018) concluded that the perched water is expected to be of sufficient quality to be pumped to the South Surge Pond to then be managed as part of the Smelter water management system. This water will be drained to a sump within the excavation bund.

The quality of this water will be regularly monitored to determine if it needs to be managed as part of the leachate management system, or if it can continue to be discharged directly into the Smelter water management system.

As with the Capped Waste Stockpile, the area of the landfill uncovered at any time will be minimised. This will allow water from the remaining capped area to be diverted away from the

exposed material and managed as clean water; only the water from the exposed material will need to be considered for management as leachate.

### 2.3.4 Leachate Storage and Treatment

#### 2.3.4.1 Leachate Storage

**Figure 2-1** shows the locations of leachate storage within the Project site. This includes the basins at the Containment Cell and adjacent to the temporary water treatment plant.

#### 2.3.4.2 On Site Treatment Plant

A modular temporary water treatment plant will be installed with the capacity to treat: existing leachate from within the Capped Waste Stockpile; contaminated stormwater collected within the exposed stockpile; contaminated stormwater and leachate from the Containment Cell; and the perched groundwater and leachate from Dickson Road South (if required).

The conceptual location of the temporary water treatment plant is shown in **Figure 2-1**. However, the temporary water treatment plant would be modular. This would allow it to be relocated closer to the leachate source and/or to facilitate access for demolition and remediation requirements.

Based on estimates of leachate generation the temporary water treatment plant will have a capacity of approximately 30 KL/day.

The temporary water treatment plant will include filtering and treatment columns to remove key contaminants including suspended solids, pH, fluoride (F) and hydrocarbons. The waste water would be treated to a level suitable to be discharged to the Smelter water management system, where it could be reused during for dust suppression.

#### 2.3.4.3 Off Site Leachate Treatment

The ability to dispose of leachate via a licenced liquid waste contractor for treatment at a licensed waste facility will also be available. Temporary leachate storage dams will be established at the Containment Cell and the Capped Waste Stockpile. The licensed liquid waste contractor will pump the leachate from these dams at a designated location into their truck.

Based on a leachate removal truck with a capacity of 20 kL, this equates to approximately 636 truck movements by a licensed liquid waste contractor if all leachate was transported for off-site treatment. This will equate to approximately eight truck movements per week, or a maximum of two movements per day.



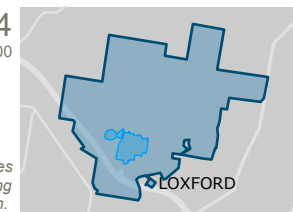
RAMBOLL AUSTRALIA - GIS MAP file : 318000533\_GIS\_P001\_RemediationEMP | F025\_LeachateMgmtV02\_V01 | 21/01/2021

Aerial photography by Nearmap, flown 15.06.2020

## Legend

- Project site
- Leachate storage dam
- Leachate treatment plant
- Leachate transfer pipeline
- ..... Clean water discharge

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1:8,000



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### 3. IMPLEMENTATION

#### 3.1 Roles and Responsibilities

Key personnel responsible for implementation of this LMP are in **Table 3-1** and consistent with the overall EMP.

**Table 3-1: Hydro Personnel and Environmental Management Responsibilities**

Position	Responsibilities
<b>OVERALL SITE MANAGEMENT</b>	
Managing Director	<p>Make certain that the Hydro Team and contractors are implementing this LMP.</p> <p>Provide adequate resources and funding for the implementation of this LMP.</p> <p>Review and approve EMP (including the SWMP and associated specialised plans).</p>
Principal Environmental Consultant	<p>Provide advice on and assistance in implementation, monitoring and auditing of environmental management and performance.</p> <p>Review and modify the LMP as directed by the Managing Director and/or Project Manager.</p>
Principal Communications Consultant	<p>Manage the mechanisms available for the community to receive information and to make enquiries or complaints about activities</p>
<b>SMELTER REMEDIATION ACTIVITIES</b>	
Project Manager	<p>Make certain that any proposed works or changes to existing activities, that may have an impact on the environment or the community (including leachate management), have the necessary legislative approval prior to the commencement of works.</p> <p>Make certain that the environmental aspects and issues, associated with proposed works or changes to existing activities, are adequately addressed in the LMP.</p> <p>Review and approve the LMP on an annual basis or when changes to activities at the Smelter occur.</p> <p>Facilitate implementation of the LMP.</p>
Construction Manager	<p>Verify that the work of contractors and Hydro personnel on the Project are undertaken in accordance with this LMP, relevant environmental management plans, procedures and standards.</p> <p>Provide appropriate training to contractors and Hydro personnel on the Project regarding environment and community requirements and responsibilities.</p> <p>Review and approve the contractors' environmental management documentation prior to commencement of activities and inform contractors of changes to the LMP.</p>
Contract Administrator	<p>Provide relevant environmental legislative, regulatory and management requirements in tender documentation.</p> <p>Verify that the work of contractors is undertaken in accordance with this LMP and other relevant environmental procedures and standards.</p>
Workplace Health and Safety (WHS) Manager	<p>Provide Hydro personnel with the necessary tools and training to enable effective implementation of the EMP and sub plans.</p> <p>Implement and maintain an induction package to be provided to all personnel working at the Smelter and Hydro Land, which will include information relevant to environmental and community management (including leachate management).</p> <p>Undertake a weekly inspection of the Project activities at the Smelter, for the duration of the Project.</p> <p>Maintain a record of personnel induction and training records.</p>

Position	Responsibilities
Remediation Contractor	<p>Comply with the requirements of the LMP as it applies to Smelter and relevant Hydro Land remediation activities.</p> <p>Implement the environmental measures and actions as described in the LMP through a Remediation EMP, sub-plans and specific procedures that comply with this LMP.</p> <p>Develop and implement procedures for self-checking management compliance with the Remediation Contractor's procedures and this LMP.</p> <p>Report potential or actual environmental incidents associated with remediation activities at the Smelter and relevant Hydro Land, and assist as required in the investigation, implementation of corrective actions and recording of the incident.</p>
<b>CARE, MAINTENANCE AND HYDRO LAND MANAGEMENT ACTIVITIES</b>	
Environmental Officer/ Hydro Land Manager	<p>Coordinate and implement the environmental monitoring program</p> <p>Verify that the work of contractors and Hydro personnel on Hydro Land are undertaken in accordance with this LMP and relevant environmental procedures and standards.</p> <p>Undertake a weekly inspection of activities on the Hydro Land that will occur for two weeks or more.</p>
<b>ALL AREAS AND ACTIVITIES</b>	
Contractors	<p>Comply with the requirements of the LMP as it applies to site environmental management and control.</p> <p>Implement the environmental measures and actions as described in the LMP through procedures and management plans that comply with this LMP.</p> <p>Develop and implement procedures for self-checking management compliance with Contractor's procedures and this LMP.</p>
All Personnel	Implementation of the relevant environmental measures described in this LMP applicable to their activities.

### 3.2 Management Measures

Hydro will implement a number of controls to manage leachate generation, treatment and disposal resulting from activities at the Smelter and Hydro Lands. The leachate management measures to be implemented on Site are outlined in **Table 3-2**.

**Table 3-2: Leachate Management Measures**

Management Measures	Action	Timing / Frequency	Responsibility	Further Detail
Water encountering any waste fill will be classified as leachate and require collection and treatment.	Surface water will be diverted around active remediation areas to minimise the volume of leachate generated during remediation activities.	Prior to and during remediation	Project Manager Remediation Contractor	Containment Cell Detailed Design
	Perimeter bunds and diversion drains will be constructed around the Containment Cell, Capped Waste Stockpile and Dickson Road Landfill to prevent stormwater entering the active remediation area.	Prior to and during remediation	Project Manager Remediation Contractor	Containment Cell Detailed Design
	Leachate generation will be minimised by reducing the area of exposed waste at any one time and covering of waste as soon as practicable.	During remediation	Project Manager Remediation Contractor	Containment Cell Detailed Design
Controlled capture of leachate within the Capped Waste Stockpile	A sump will be constructed within the low point of the Capped Waste Stockpile to allow gravity drainage of leachate to one collection point.	Prior to remediation	Project Manager Remediation Contractor	Containment Cell Detailed Design
	The leachate will be transferred to an appropriately lined temporary leachate storage dam.	During remediation	Project Manager Remediation Contractor	Containment Cell Detailed Design
	Leachate will be pumped out by a licensed waste contractor for off site treatment and disposal or to the temporary water treatment plant for onsite treatment.	During remediation	Project Manager Remediation Contractor	Containment Cell Detailed Design
Controlled capture of leachate within the Containment Cell	The Containment Cell will be subdivided into four sub-cells by intracell bunds. The sub-cells will be filled progressively, resulting in potential leachate generation occurring from only one cell at a time.	Prior to and during remediation	Project Manager Remediation Contractor	Containment Cell Detailed Design
	Leachate will be drained to one of two leachate sumps, located at the eastern boundary of the containment cell.	During remediation	Project Manager Remediation Contractor	Containment Cell Detailed Design
	Leachate extraction pumps will be used to extract the leachate and pumped to the leachate buffer storage dam for temporary storage.	During remediation	Project Manager Remediation Contractor	Containment Cell Detailed Design
	The operation depth of leachate in the cell will be limited to no more than 300 mm except during large storm events. Where the level of leachate exceeds 300 mm it shall be lowered to 300 mm as soon as is practicable.	During remediation	Project Manager Remediation Contractor	Containment Cell Detailed Design

Management Measures	Action	Timing / Frequency	Responsibility	Further Detail
On site leachate treatment through a temporary water treatment plant prior to discharge into the Smelter water management system.	Submit a detailed design for the plant to the Department and the EPA for approval.	Prior to construction of the plant	Project Manager Remediation Contractor	N/A
	The temporary water treatment plant will only operate during remediation activities and be decommissioned upon completion of the Containment Cell.	During remediation	Project Manager Remediation Contractor Environmental Officer	N/A
	Discharge from the temporary water treatment plant will be of a suitable quality to be discharged to the Smelter water management system and applied as dust suppression.	During remediation	Project Manager Remediation Contractor Environmental Officer	N/A
	Discharge from the temporary water treatment plant will be to the Smelter water management system or collected by a licensed contractor (if required).	During remediation	Project Manager Remediation Contractor Environmental Officer	N/A
Leachate transported from the Smelter is to be managed in accordance with the Protection of the Environment Operations (Waste) Regulation 2005 (POEO Waste Regulation) and the <i>Waste Classification Guidelines</i> .	Any leachate requiring transportation from the Smelter to a licensed facility will be subjected to waste tracking.	Prior to and during remediation	Project Manager Remediation Contractor Site Services Manager Waste Removal Contractor	Section 2.3.3 (waste tracking, transport and disposal) of the WMP
	Leachate will be removed from the Smelter to a licensed facility by a licenced waste contractor and transported to a licenced waste facility.	Prior to and during remediation	Project Manager Remediation Contractor Site Services Manager Waste Removal Contractor	Section 2.3.3 (waste tracking, transport and disposal) of the WMP
	A Waste Consignment Authorisation must be obtained, prior to transporting the leachate. The licenced waste contractor who removes the leachate is responsible for completing the Waste Consignment Authorisation.	Prior to and during remediation	Project Manager Remediation Contractor Site Services Manager Waste Removal Contractor	Section 2.3.3 (waste tracking, transport and disposal) of the WMP
	The types, quantity and receiving location for all leachate transported from the Smelter will be recorded within a database.	During remediation	Project Manager Remediation Contractor Site Services Manager Waste Removal Contractor	Section 2.3.3 (waste tracking, transport and disposal) of the WMP
Regular visual inspection of stormwater drainage to ensure stormwater and leachate are segregated.	Conduct fortnightly and event based visual inspection of drainage controls including perimeter bunds and diversion drains.	During remediation	Environmental Officer	Section 5.2 of the EMP (inspections)

Management Measures	Action	Timing / Frequency	Responsibility	Further Detail
Continue the groundwater monitoring downgradient of the leachate impacted groundwater resulting from the Capped Waste Stockpile.	Continue quarterly on-going monitoring of groundwater wells down-gradient of the Capped Waste Stockpile in accordance with the EPL.	During remediation	Project Manager Remediation Contractor Environmental Officer	Section 4.1 of the SWMP
Continue the surface water monitoring program to assess the impact that activities have on sensitive receiving environments.	Continue the monthly surface water monitoring to assess compliance with the relevant surface water quality criteria.	During activities Monthly monitoring	Environmental Officer	Section 4.1 of the SWMP
	Record, interpret and report on surface water monitoring data.	Prior to and during demolition	Environmental Officer	Section 4.1 of the SWMP

## 4. MONITORING AND REVIEW

### 4.1 Monitoring

#### 4.1.1 Leachate Monitoring

Within the Containment Cell, leachate monitoring will be undertaken on a quarterly basis or after a significant storm event or immediately following an earthquake. Once the leachate collection sump reaches 300 mm level, it will be pumped out, temporarily stored in the leachate buffer storage dam and either collected by a licenced liquid waste contractor or treated through the water treatment plant.

#### 4.1.2 Surface Water

Hydro will continue to monitor surface water quality to confirm remediation activities are not causing harm to the environment or community and to maintain compliance with relevant approvals and licences.

Further details on the surface water monitoring requirements are described in Section 4.1.1 of the SWMP.

#### 4.1.3 Groundwater Monitoring

Hydro undertakes quarterly groundwater monitoring of selected groundwater wells at the Smelter. The program involves the collection of groundwater samples from 28 groundwater monitoring wells. This includes wells that assess the performance of the Capped Waste Stockpile leachate interception trench and the condition of the leachate plume that the trench was installed to mitigate.

The groundwater wells target the leachate plume that is migrating from the Capped Waste Stockpile in a north-easterly direction. The leading front of the leachate plume is approximately 300 m north-east of the Capped Waste Stockpile. The extent of the plume is shown on the attached figure. Characteristics of the leachate includes elevated concentrations of Fluoride, Cyanide, Aluminium and alkaline pH.

Further details on the groundwater monitoring requirements are described in Section 4.1.3 of the SWMP.

#### 4.1.4 Monitoring Program

The surface water and groundwater monitoring program is described in Table 4-1 of the SWMP.

#### 4.1.5 Soil and Water Management

As noted in **Table 3-2** the erosion and sediment controls including stormwater drainage controls (such as those diverting clean water away from waste materials and leachate) will be inspected fortnightly and after a rain event (greater than 5mm in any one period up to 24 hours in duration). Also, as noted in **Table 3-2** the existing surface water drainage and dams will be inspected prior to commencing remediation activities, and on a monthly basis thereafter.

Where an issue is identified during the inspection, the controls or the system will be maintained or repaired as required.

Records are to be taken (and filed) during these inspections and made available for review upon request of the EPA and Cessnock City Council.

### 4.2 Reporting

All internal and external environmental reporting requirements will be undertaken in accordance with the EMP.

Reporting will also be undertaken in accordance with relevant legislation, guidelines and notification requirements, as outlined in **Section 1.4**.

### 4.3 Non-conformances

The need for preventative or corrective action arises from the identification of non-conformance with environmental legal requirements, Hydro environmental requirements or the potential for non-conformances to occur.

Non-conformances will be resolved and recorded in accordance with the EMP.

#### **4.4 Complaints**

Community Complaints are considered environmental incidents and are investigated and documented accordingly. This will include any complaints relating to Smelter-related soil and water quality issues.

Investigations will be conducted by the Environment Officer, including provision of feedback to the complainant. Corrective actions will be documented and regularly reviewed until complete and signed off.

Handling of complaints will be undertaken in accordance with the EMP.

#### **4.5 Review and Improvement**

Continual improvement of the LMP will be achieved by the continual evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The Environmental Officer is responsible for ensuring that a regular review of the EMP and specialist management plans is undertaken.

The EMP and specialist management plans will be reviewed annually by an independent consultant in conjunction with preparation of the Annual Environmental Management Report (AEMR), or if changes to existing operations occur.

Reviews will be recorded in the document control section of this plan.

## 5. REFERENCES

ANZECC. 2000. *National Water Quality Management Strategy: Australian Guidelines for Fresh and Marine Water Quality*.

Department of Environment and Conservation (DEC). 2007. *Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination*.

Landcom. 2004. *Managing Urban Stormwater – Soils and Construction, Volume 1*.

Pulver Cooper and Blackley (PCB). 2018. *Flood Modelling and Hydrology Review*.

Ramboll Environ (2015) *Statement of Environmental Effects - Demolition of Former Aluminium Smelter Buildings at Kurri Kurri*

Ramboll Environ (2016) *Environmental Impact Statement: Former Hydro Aluminium Kurri Kurri Smelter Demolition and Remediation*

Ramboll (2018) *Environmental Impact Statement: Former Hydro Aluminium Kurri Kurri Smelter Stage 2 Demolition*

Ramboll (2020) *Response to Submissions Report: Former Aluminium Kurri Kurri Smelter Remediation*

## 6. LIMITATIONS

Ramboll Australia Pty Ltd prepared this report in accordance with the scope of work as outlined in our proposal to Hydro Aluminium Pty Ltd dated 20 July 2018 and in accordance with our understanding and interpretation of current regulatory standards.

Site conditions may change over time. This report is based on conditions encountered at the site at the time of the report and Ramboll Australia Pty Ltd disclaims responsibility for any changes that may have occurred after this time.

The conclusions presented in this report represent Ramboll Australia Pty Ltd's professional judgment based on information made available during the course of this assignment and are true and correct to the best of Ramboll Australia Pty Ltd's knowledge as at the date of the assessment.

Ramboll Australia Pty Ltd did not independently verify all of the written or oral information provided to Ramboll Australia Pty Ltd during the course of this investigation. While Ramboll Australia Pty Ltd has no reason to doubt the accuracy of the information provided to it, the report is complete and accurate only to the extent that the information provided to Ramboll Australia Pty Ltd was itself complete and accurate.

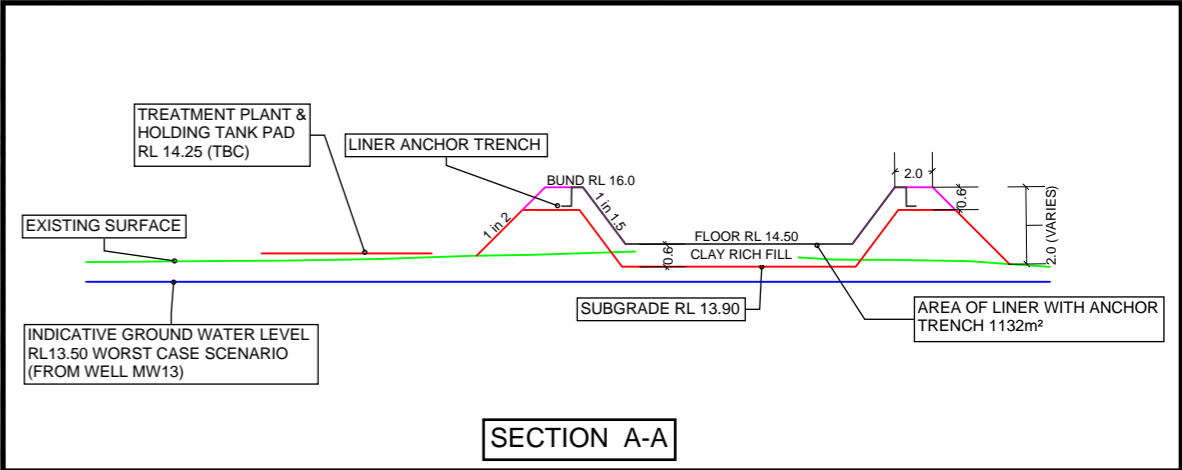
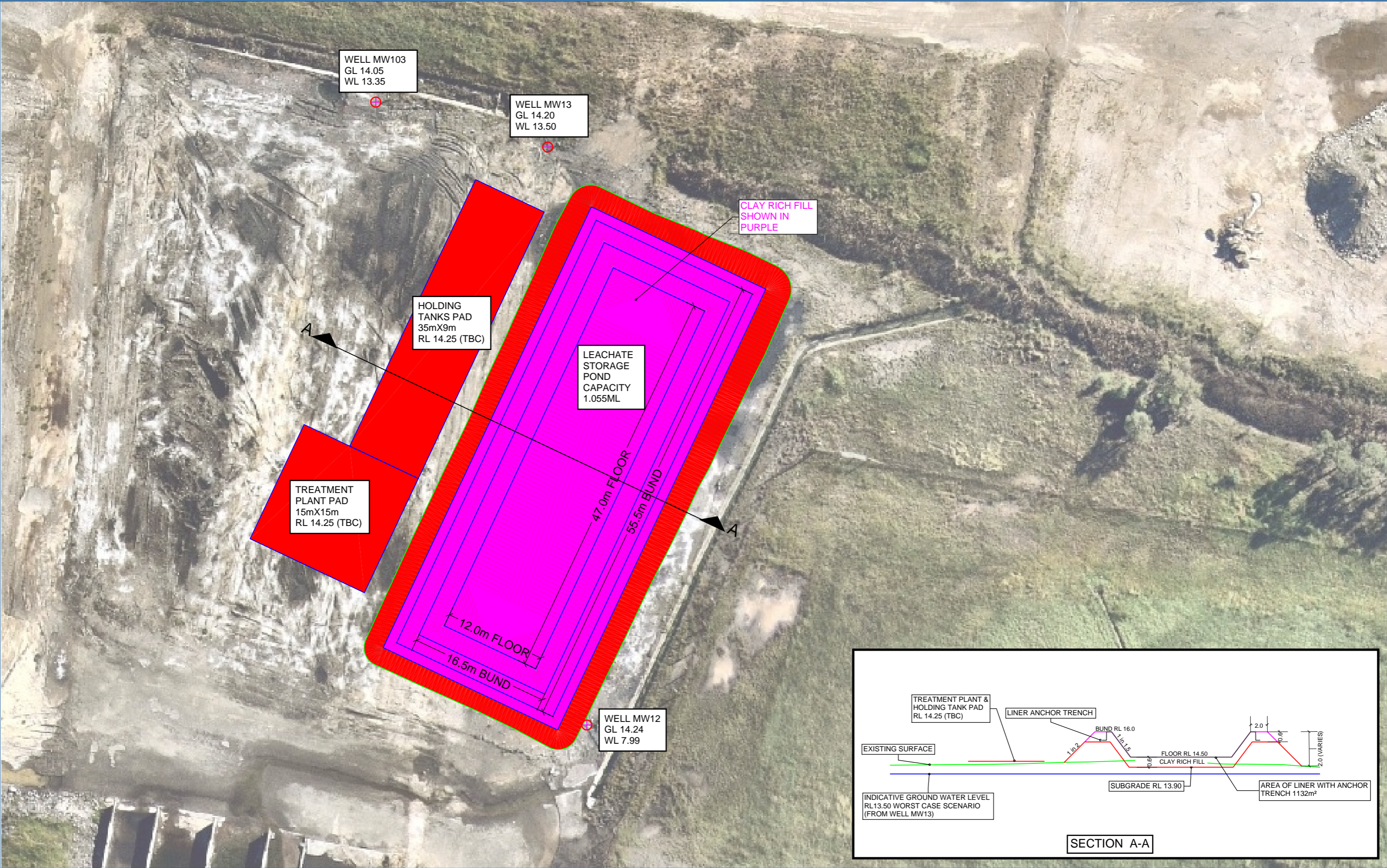
This report does not purport to give legal advice. This advice can only be given by qualified legal advisors.

### 6.1 User Reliance

This report has been prepared exclusively for Hydro Aluminium Pty Ltd. It may not be relied upon by any other person or entity without Ramboll Australia Pty Ltd's express written permission.

## **APPENDIX 2**

### **LEACHATE STORAGE PONDS DESIGN**



REVISIONS AND APPROVALS						0	5	10	15	20	25	30	35	40	45	50mm ON A3 SIZE ORIGINAL	
REV	DATE	DESCRIPTION	DRN	CHKD	APPRD	SCALE: H 1:400										V 1:800	
01	20/04/2021	Leachate Pond and Treatment Plant For Review	DS	DS	CA	SURVEY DATE: 20/04/2021										PLOTTED BY:	
						12d MODEL PROJECT: 1640 HAKK 2021 Project										COORD. SYSTEM: MGA94	
						PLOT DATE: 20/04/2021										HEIGHT DATUM: AHD	
						PLOT FILE: 1640-009-1										ORIGIN OF LEVELS:	
						Copyright – "This document is and shall remain the property of Daracon Group. The Document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited."											

**DARACON**  
Group

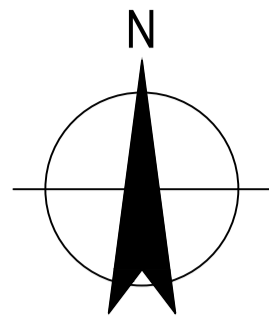
DARACON GROUP  
20 KULLARA CLOSE, BERESFIELD NSW  
AUSTRALIA 2322  
PH: 02 4974 9200    dgroup@daracon.com.au  
FAX: 02 4951 1070    www.daracon.com.au  
BERESFIELD | AUBURN | MOUNT THORLEY | GUNNEDAH

PROJECT: Containment Cell  
Hydro Aluminium Kurri Kurri  
DARACON JOB No: 1640  
CLIENT: Hydro Aluminium  
CLIENT JOB No:  
DRAWING STATUS: **Review**

SHEET  
1 of 1

DRAWING TITLE:  
**Leachate Pond  
& Treatment Plant**  
Stockpile Revival  
**1640-009**  
DRAWING NUMBER

A3  
**01**  
REV

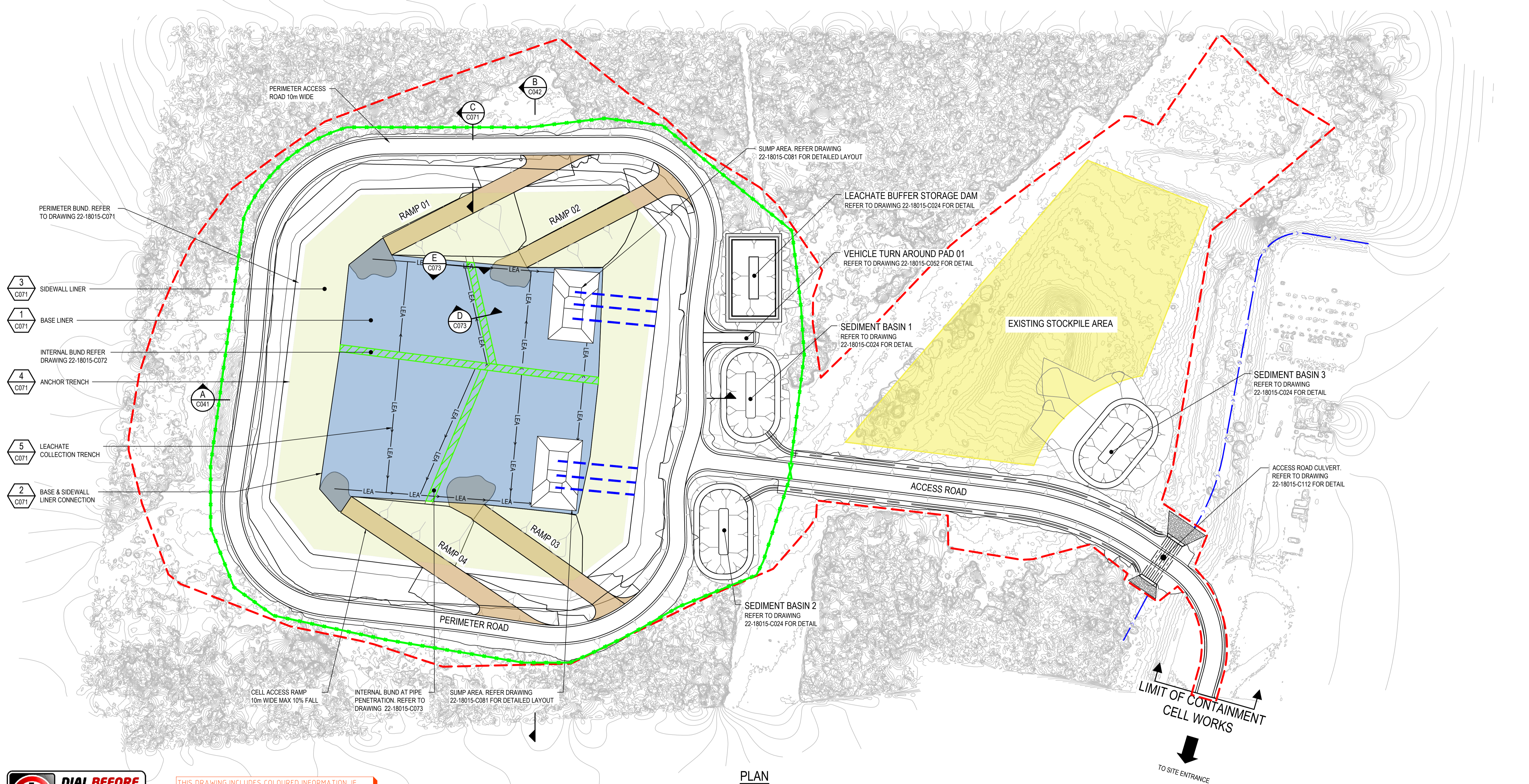


NOTES:

1. REFER TO DRG. 22-18015-C022 FOR ACCESS ROAD ARRANGEMENT.
2. REFER TO DRG. 22-18015-C023 FOR STORMWATER ARRANGEMENT.
3. REFER TO DRG. 22-18015-C024 FOR POND ARRANGEMENT.
4. REFER TO DRG. 22-18015-C025 FOR FINAL CAP ARRANGEMENT.

LEGEND:

	SIDEWALL LINER AREA		EXISTING STOCKPILE AREA		CONTAINMENT CELL WORKS AREA
	BASE LINER AREA		INTERNAL BUND AREA		LEACHATE COLLECTION TRENCH
	CELL ACCESS RAMP		CULVERT WITH HEADWALLS		GROUNDWATER, LEAK DETECTION AND LEACHATE RISER PIPEWORK
					DESIGN CONTOURS
					EXISTING CONTOURS
					FAUNA EXCLUSION FENCE. REFER TO RMS DRAWING R0800-31 FOR DETAILS
					FAUNA EXCLUSION GATE. REFER TO RMS DRAWING R0800-31 FOR DETAILS



PLAN  
SCALE 1:1000



THIS DRAWING INCLUDES COLOURED INFORMATION. IF YOU HAVE A BLACK AND WHITE COPY YOU DO NOT HAVE ALL THE INFORMATION. THIS NOTE IS COLOURED RED.

FOR CONSTRUCTION

0	ISSUED FOR CONSTRUCTION		RK	AR	IG	29.09.19
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date



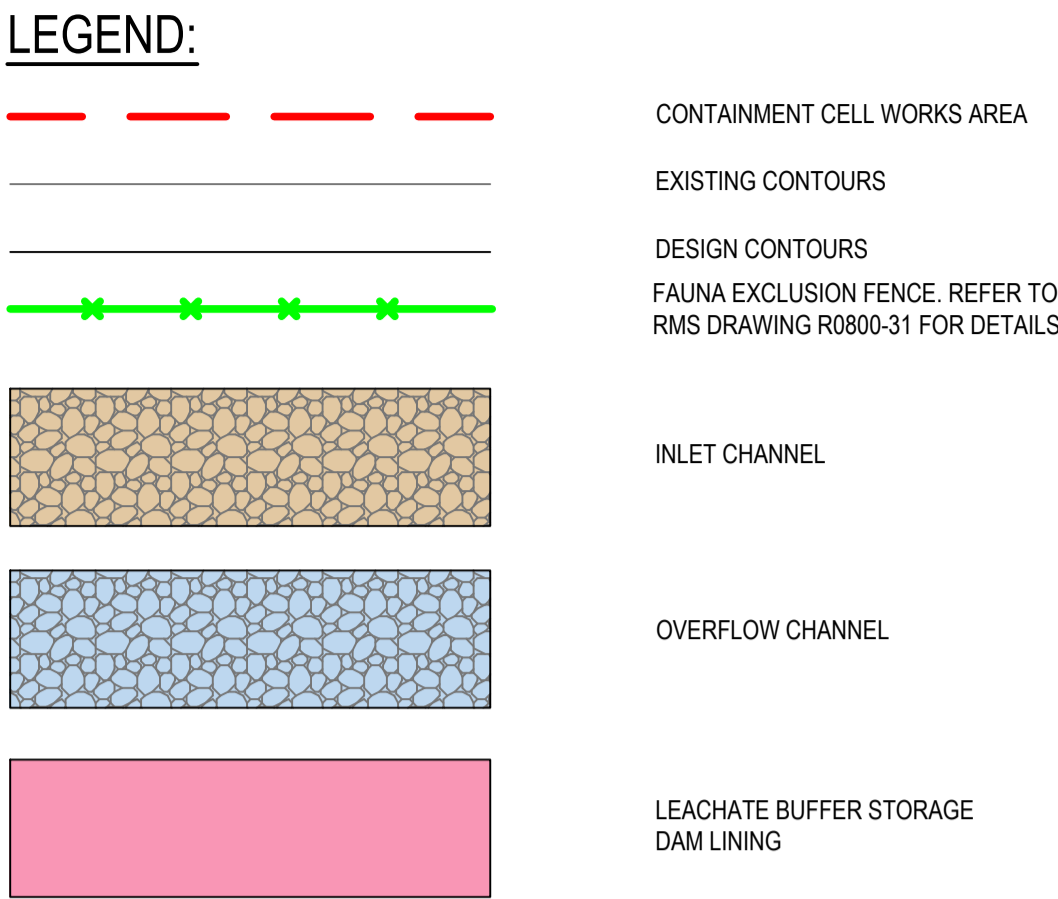
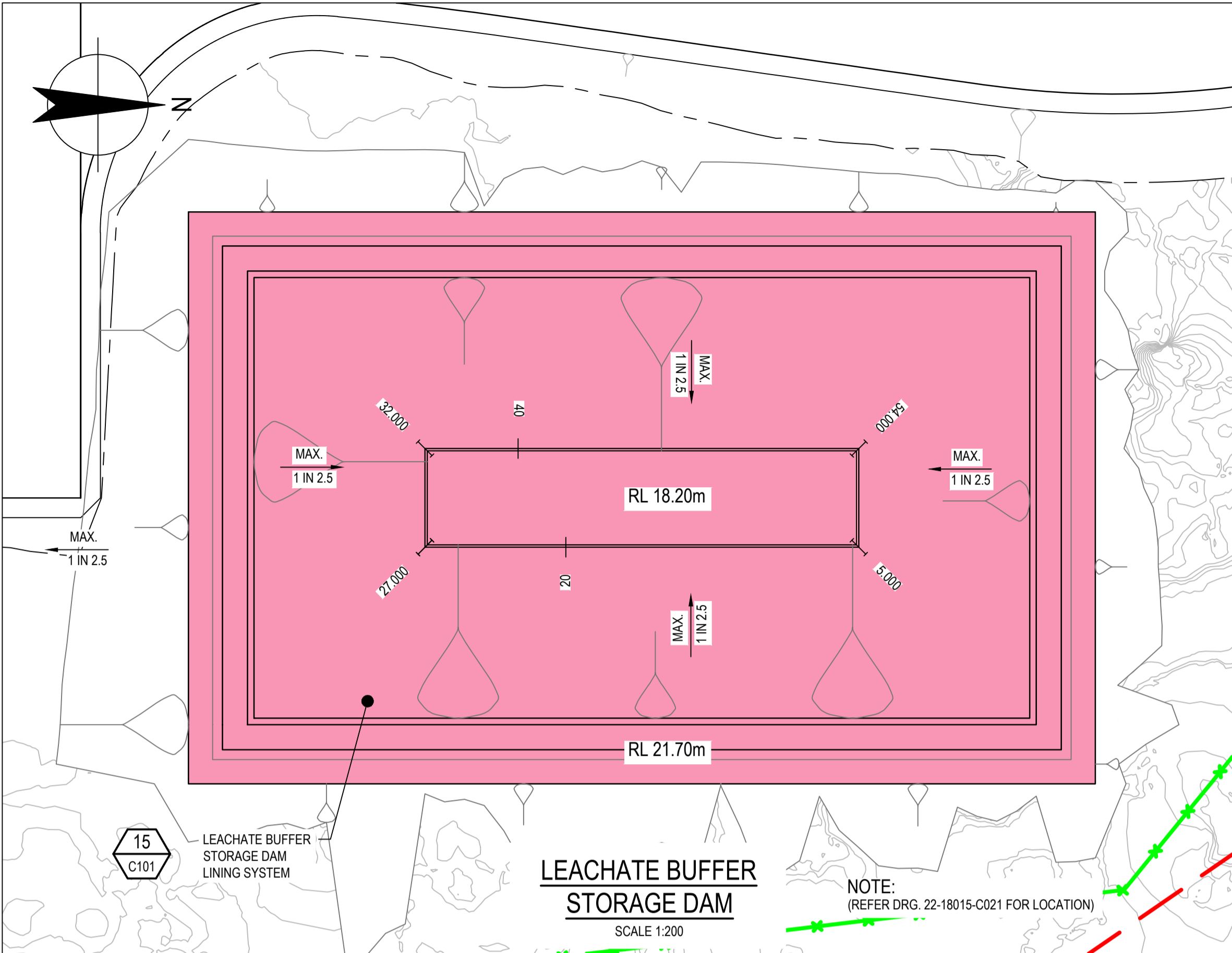
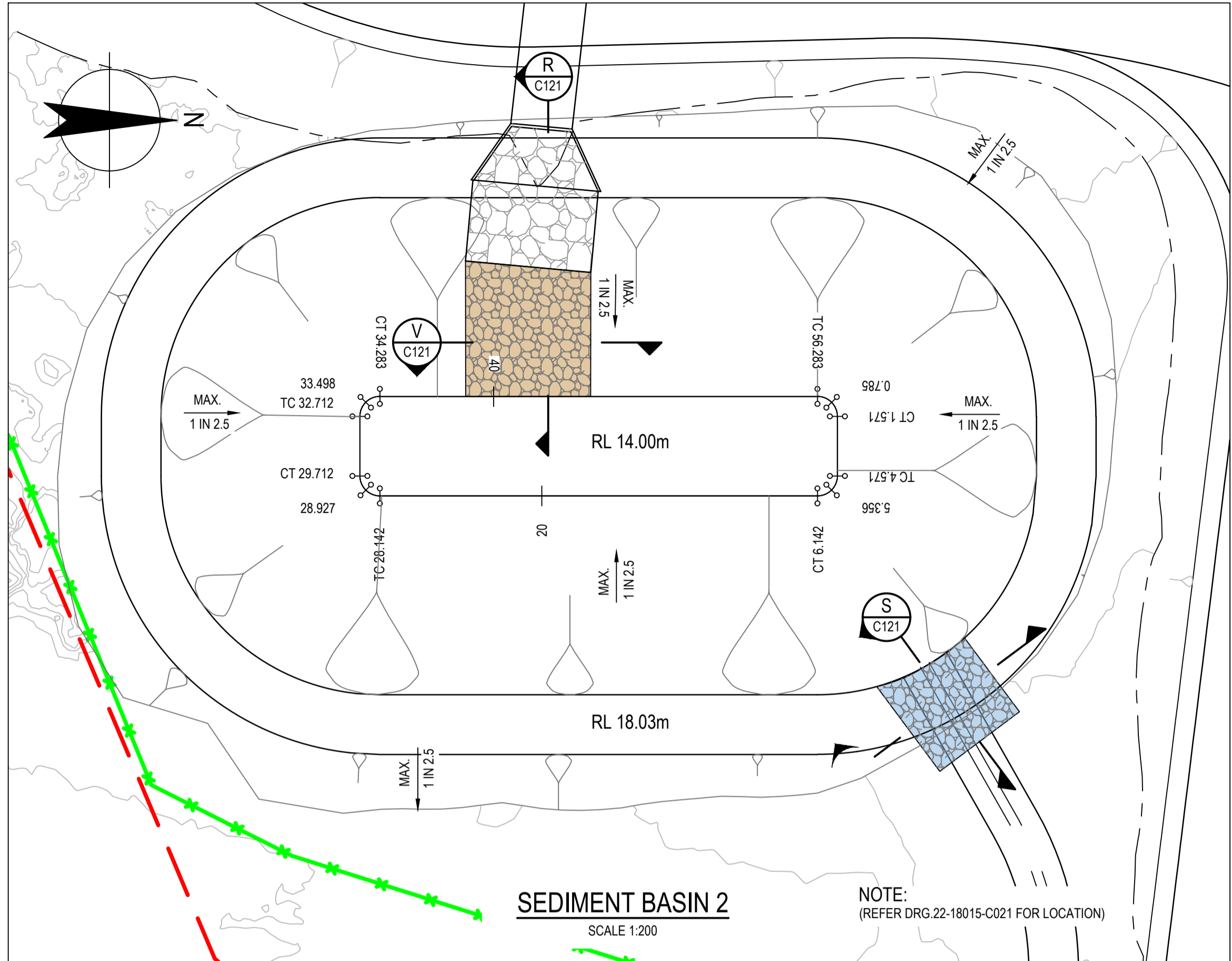
Suite 10, 6 Reliance Drive Tuggerah Business Park  
PO Box 3220 Tuggerah NSW 2259  
T 61 2 4350 4100 F 61 2 4350 4101  
E centralcoastmail@ghd.com W www.ghd.com

DO NOT SCALE

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Drawn	J. CASIO	Designer	P. ETCHHELLS
Drafting Check	P. PRASAD	Design Check	A. ROBERTS
Approved (Project Director)	J. GREGSON*	Date	26.09.19
Scale	1:1000	This Drawing must not be used for Construction unless signed as Approved	

Client	HYDRO ALUMINIUM KURRI KURRI PTY LTD
Project	CONTAINMENT CELL DETAILED DESIGN
Title	GENERAL ARRANGEMENT CONTAINMENT CELL
Original Size	A1
Drawing No:	22-18015-C021
Rev:	0



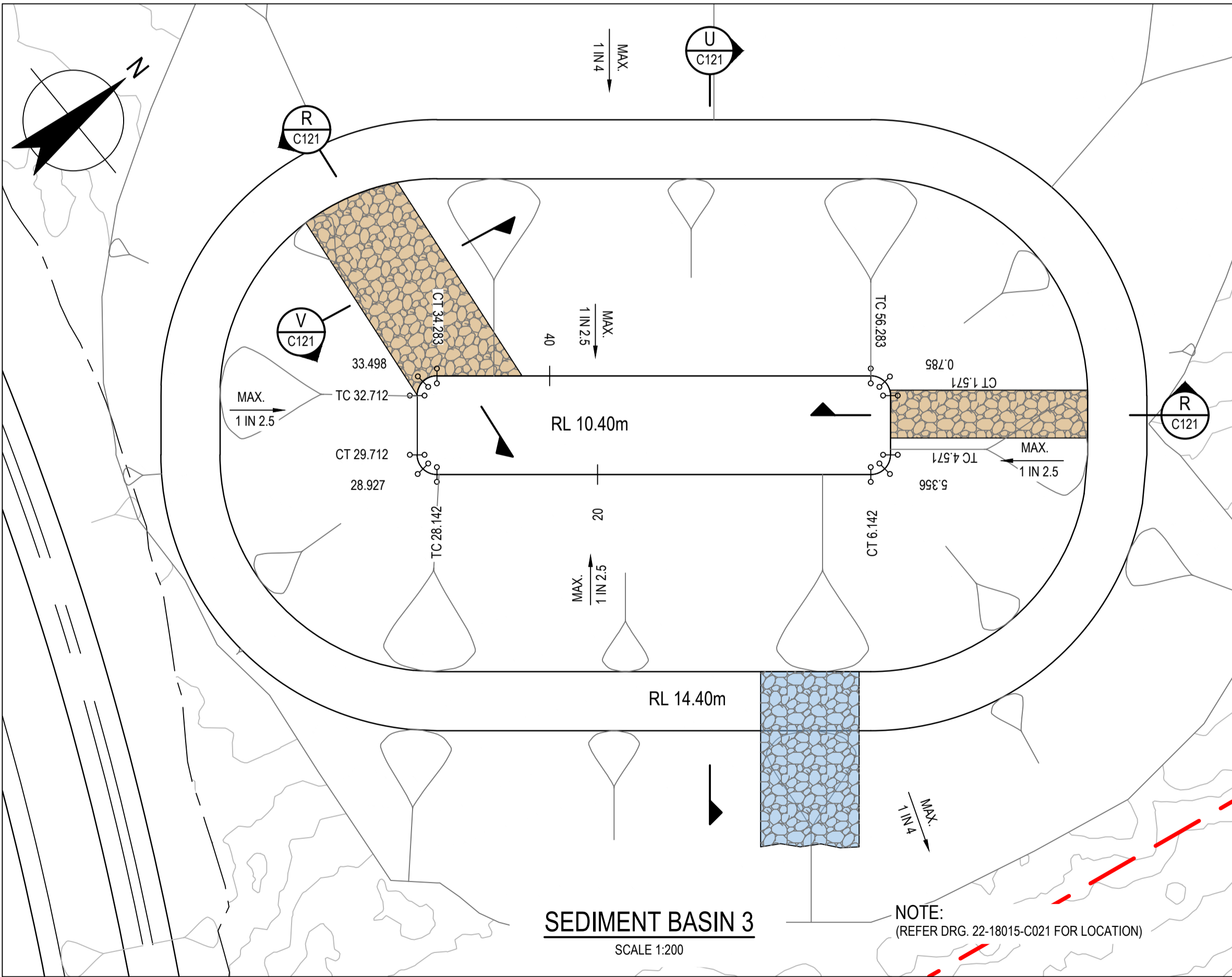
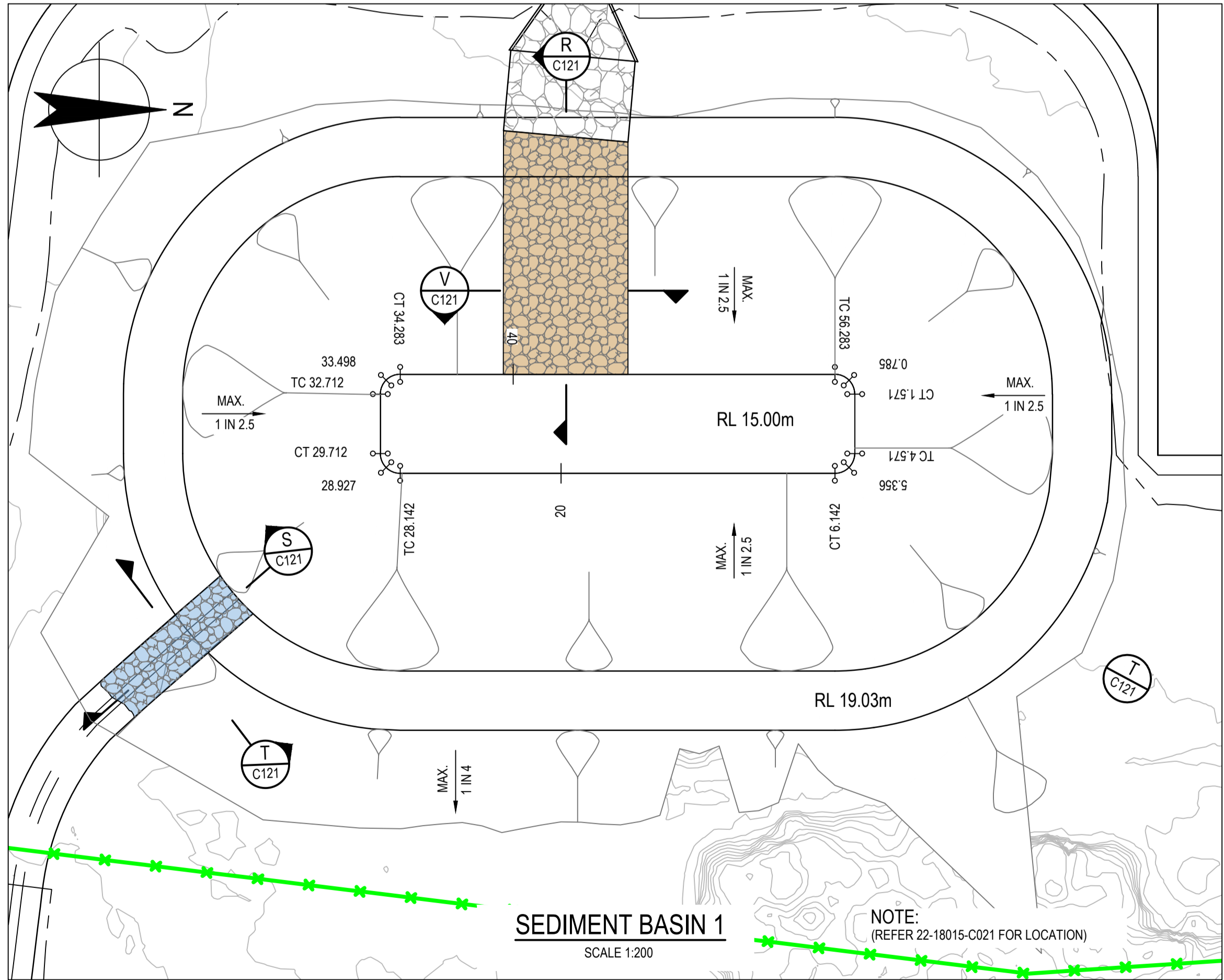
- NOTES:**
- LEACHATE BUFFER STORAGE DAM HAS BEEN SIZED TO CONTAIN ONE MONTH PEAK GENERATION VOLUME.
  - SEDIMENT DETENTION BASIN SIZED TO ACCOMMODATE 5.2ha OF DISTURBED AREA.

SEDIMENT BASIN 01 SETOUT POINTS			
CHAINAGE	EASTING	NORTHING	HEIGHT
0.000	357191.998	6371450.369	15.000
0.785	357191.998	6371451.369	15.000
1.571	357192.998	6371451.369	15.000
4.571	357195.998	6371451.369	15.000
5.356	357196.998	6371451.369	15.000
6.142	357196.998	6371450.369	15.000
28.142	357196.998	6371428.369	15.000
28.927	357196.998	6371427.369	15.000
29.712	357195.998	6371427.369	15.000
32.712	357192.998	6371427.369	15.000
33.498	357191.998	6371427.369	15.000
34.283	357191.998	6371428.369	15.000

SEDIMENT BASIN 02 SETOUT POINTS			
CHAINAGE	EASTING	NORTHING	HEIGHT
0.000	357177.947	6371379.363	14.000
0.785	357177.947	6371380.363	14.000
1.571	357178.947	6371380.363	14.000
4.571	357181.947	6371380.363	14.000
5.356	357182.947	6371380.363	14.000
6.142	357182.947	6371379.363	14.000
28.142	357182.947	6371357.363	14.000
28.927	357182.947	6371356.363	14.000
29.712	357181.947	6371356.363	14.000
32.712	357178.947	6371356.363	14.000
33.498	357177.947	6371356.363	14.000
34.283	357177.947	6371357.363	14.000

LEACHATE BUFFER STORAGE DAM SETOUT POINTS			
CHAINAGE	EASTING	NORTHING	HEIGHT
0.000	357193.586	6371511.164	17.600
5.000	357198.586	6371511.164	17.600
27.000	357198.586	6371489.164	17.600
32.000	357193.586	6371489.164	17.600

SEDIMENT BASIN 03 SETOUT POINTS			
CHAINAGE	EASTING	NORTHING	HEIGHT
0.000	357389.148	6371424.286	10.400
0.785	357389.779	6371425.062	10.400
1.571	357390.555	6371424.432	10.400
4.571	357392.883	6371422.540	10.400
5.356	357393.659	6371421.939	10.400
6.142	357393.029	6371421.103	10.400
28.142	357379.154	6371404.060	10.400
28.927	357378.523	6371403.283	10.400
29.712	357377.747	6371403.914	10.400
32.712	357375.419	6371405.806	10.400
33.498	357374.643	6371406.437	10.400
34.283	357375.274	6371407.213	10.400



FOR CONSTRUCTION

0	ISSUED FOR CONSTRUCTION		RK	AR	IG	29.09.19
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date



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PO Box 3220 Tuggerah NSW 2259  
T 61 2 4350 4100 F 61 2 4350 4101  
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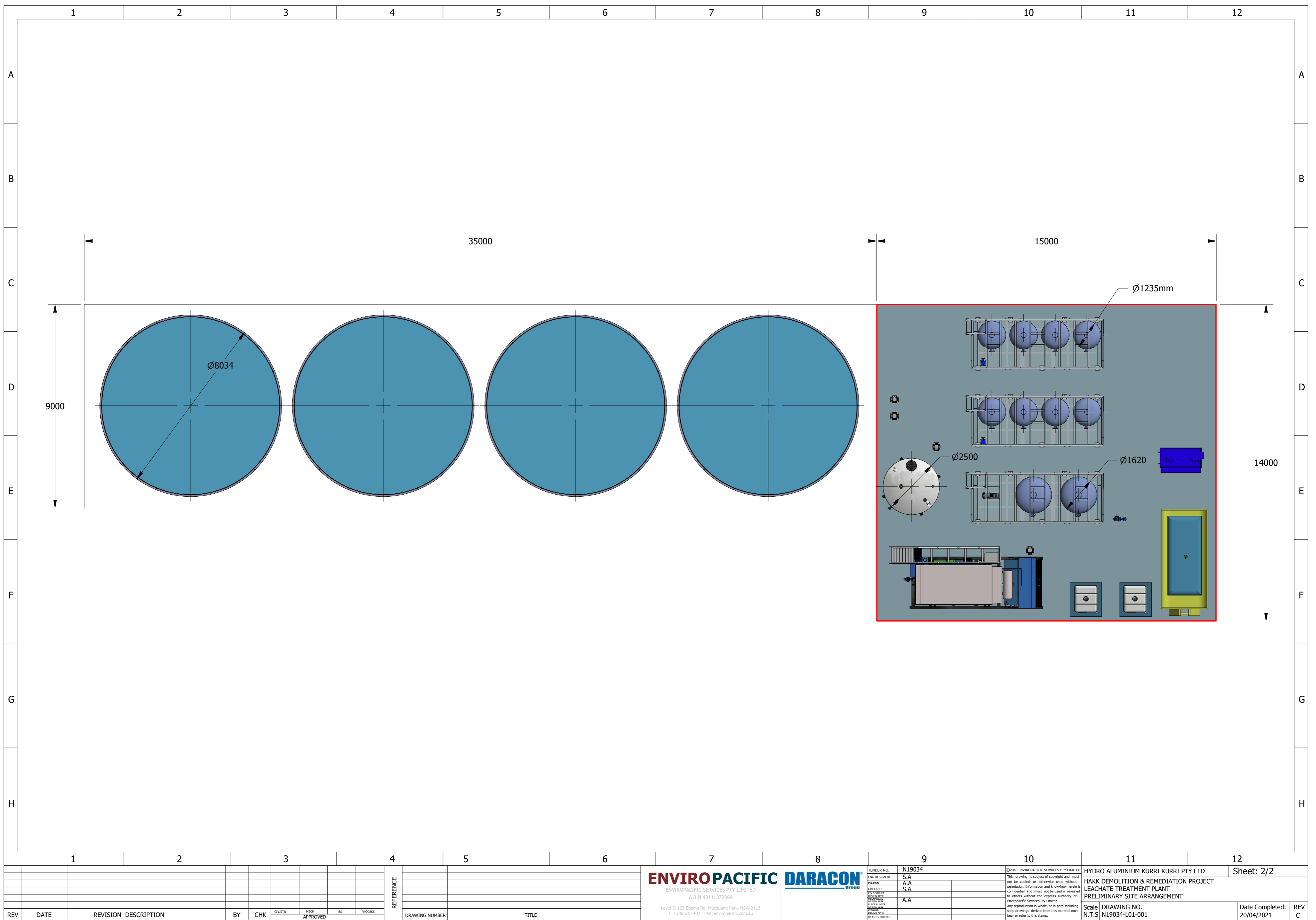
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Drawn	J. CASIO	Designer	P. ETCHHELLS
Drafting Check	P. PRASAD	Design Check	A. ROBERTS
Approved	J. GREGSON* (Project Director)		
Date	26.09.19		
Scale	1:200	This Drawing must not be used for Construction unless signed as Approved	

Client	HYDRO ALUMINIUM KURRI KURRI PTY LTD		
Project	CONTAINMENT CELL DETAILED DESIGN		
Title	DETAIL PLAN SEDIMENT BASINS & STORAGE DAM		
Original Size	A1	Drawing No:	22-18015-C024
			Rev: 0

## **APPENDIX 3**

### **TEMPORARY WATER TREATMENT PLANT DESIGN**



## **APPENDIX 4**

### **COPIES OF CORRESPONDENCE WITH AGENCIES**

Environment Protection Authority  
PO Box 488G  
Newcastle NSW 2300  
Attention: Hamish Rutherford  
Email: [Hamish.Rutherford@epa.nsw.gov.au](mailto:Hamish.Rutherford@epa.nsw.gov.au)

Date 21/01/2021

## **Modification to the development consent for SSD 6666 for the construction and operation of an onsite Temporary Water Treatment System**

Development consent for State Significant Development (SSD) 6666 was granted to Hydro Aluminium Kurri Kurri Pty Ltd (Hydro) under Part 4 of the *Environmental Planning and Assessment Act 1979* on 23 December 2020 for remediation of the former aluminium smelter at Hart Road Loxford (the Project).

The approved project included the management of leachate collected during remediation activities at the Smelter via an offsite method (pumping leachate from collection sumps by a licensed liquid waste contractor for treatment at a licensed facility) with the option for an onsite Temporary Water Treatment Plant. The Response to Submissions Report notes that *"In the event that Hydro decides to proceed with construction and operation of an on site leachate treatment plant, Hydro would submit a detailed design for review and approval by the Department and the EPA"*.

Since submission of the Response to Submissions Report, Hydro has undertaken further review of the environmental and economic factors associated with onsite versus offsite treatment methods of leachate and has determined that temporary onsite treatment is preferred during the remediation works. A modification to the development consent for SSD 6666 is therefore required to enable the construction and operation of an onsite Temporary Water Treatment Plant and associated infrastructure, collectively called the Temporary Water Treatment System, and to enable discharge of the treated leachate to the existing water management system (the Modification).

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Australia

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The Modification is generally comprised of the following activities:

- Construction of an onsite Temporary Water Treatment System comprised of:
  - Onsite Temporary Water Treatment Plant adjacent to the Capped Waste Stockpile
  - Associated pipelines and infrastructure
- Construction of a pipeline from the Containment Cell leachate storage dam to the Temporary Water Treatment Plant
- Operation and ongoing maintenance of the Temporary Water Treatment System
- Discharge of treated water to the existing Smelter water management system
- Decommissioning of the Temporary Water Treatment System when leachate generation rates make the offsite treatment more suitable (forecast to be approximately 12 months after containment cell capping).

The proposed location of the onsite Temporary Water Treatment Plant is only about 200 metres northeast of the location shown in Appendix 25 of the Response to Submissions Report. It also requires a minor modification of the location of the one megalitre leachate storage dam near the Capped Waste Stockpile to accommodate the proposed relocation of the treatment plant. Relocating the treatment plant to directly adjacent to the dam removes the need for the connecting pipeline of 170 metres length.

Offsite treatment would be retained as a potential leachate treatment option: it would, however, only be used: when needed due to excessive leachate generation (actual or predicted), if the onsite treatment plant was unavailable for maintenance; and when leachate production levels are low enough to not warrant the operation of the onsite treatment plant.

A figure showing the location of the proposed Temporary Water Treatment System infrastructure is provided as an attachment to this letter. The location is consistent with the proposed location presented in the Response to Submissions Report. Further details on the Temporary Water Treatment System would be provided in the Statement of Environmental Effects to supporting the Modification Application.

Hydro holds an Environmental Protection Licence (EPL) for the Smelter administered by the Environmental Protection Authority under the *Protection of the Environment Operations Act 1997* (POEO Act) (EPL No. 1548). EPL 1548 applies to chemical storage and waste generation activities at the site.

Hydro understands that the Modification would not be classified as a scheduled activity under Schedule 1 of the POEO Act as the Temporary Water Treatment System does not trigger any of the listed activities.

Activities associated with the Modification would be undertaken in accordance with the EPL. Relevant conditions of the EPL relating to the Modification are summarised in the table below.

Condition	Relevance to the Modification
P1.2	Authorises water discharge to the Irrigation area and specifies monitoring requirements
L1.1	The licensee must comply with section 120 of the POEO Act (pollution of waterways)
O2	All plant and equipment installed at the premises or used in connection with the licensed activity must be maintained and operated in a proper and efficient manner
O3	Prescribes conditions relating to minimisation of dust generation and emissions

Condition	Relevance to the Modification
O5	The licensee must ensure that any liquid and/or non-liquid waste generated and/or stored and/or processed at the premises is assessed and classified in accordance with the EPA's Waste Classification Guidelines
O6.2	The licensee must ensure that hazardous or restricted solid waste is stored or contained in a secure manner so as to prevent any hazard and the escape of waste and/or leachate
R2	The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act
E1.1	The licensee is to continue operating the groundwater interception trench and leachate management system for the Capped Waste Stockpile

Ramboll invites the Environment Protection Authority to provide comment on the Modification.

A Statement of Environmental Effects (SEE) has been prepared in accordance with the Department of Planning, Industry and Environment *Modifying an Approved Project Draft Environmental Impact Assessment Guidance Series* (June 2017) to support the modification to the development consent for SSD 6666 under section 4.55(2) of the EP&A Act.

Section 4.55(2) of the EP&A Act allows for a development consent to be modified by the consent authority to which the original application was made, provided the modification is “*substantially the same development*” for which the consent was originally granted. The Modification is considered to be substantially the same development to the approved under SSD 6666 as:

- The overall nature and scale of the development remains similar
- The environmental impacts associated with the development are substantially the same
- The majority of the development remains unchanged to that approved.

Additionally, onsite treatment provides greater certainty during the remediation activities regarding leachate management by expanding the treatment options available to Hydro and the Remediation Contractor. On site treatment provides Hydro and the Remediation Contractor an on site option over which they have direct management, which would be complemented by the existing off site treatment facilities.

The key issues considered in the SEE include:

- Soil and water
- Hazards and risks
- Air quality and odour
- Noise and vibration
- Transport and access
- Visual
- Waste
- Biodiversity
- Heritage.

The SEE compares the potential impacts of the approved project under SSD 6666 to any changes that may occur as a result of the Modification and recommend any additional management and mitigation measures where required.

Hydro invites the Environment Protection Authority to provide comment on the Modification.

To allow us to complete the SEE and formally submit the Modification Application, we request that you respond by 31 January 2021.

Please feel free to give me a call should you wish to discuss or to arrange a meeting.

Yours sincerely

**Shaun Taylor**

Senior Managing Consultant

A handwritten signature in black ink, appearing to be 'S. Taylor', with a long horizontal line extending to the right.

D +61249625444

M +61408386663

[staylor@ramboll.com](mailto:staylor@ramboll.com)



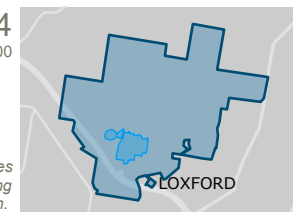
RAMBOLL AUSTRALIA - GIS MAP file : 318000533\_GIS\_P001\_RemediationEMP | F025\_LeachateMgmtV02\_V01 | 21/01/2021

Aerial photography by Nearmap, flown 15.06.2020

## Legend

- Project site
- Leachate storage dam
- Leachate treatment plant
- Leachate transfer pipeline
- ..... Clean water discharge

A4  
1:8,000



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Department of Planning, Industry and Environment  
4 Parramatta Square  
12 Darcy St  
Parramatta NSW 2150  
Attention: Sheelagh Laguna  
Email: [sheelagh.laguna@planning.nsw.gov.au](mailto:sheelagh.laguna@planning.nsw.gov.au)

Date 25/01/2021

## **Modification to the development consent for SSD 6666 for the construction and operation of an onsite Temporary Water Treatment System**

Development consent for State Significant Development (SSD) 6666 was granted to Hydro Aluminium Kurri Kurri Pty Ltd (Hydro) under Part 4 of the *Environmental Planning and Assessment Act 1979* on 23 December 2020 for remediation of the former aluminium smelter at Hart Road Loxford (the Project).

The approved project included the management of leachate collected during remediation activities at the Smelter via an offsite method (pumping leachate from collection sumps by a licensed liquid waste contractor for treatment at a licensed facility) with the option for an onsite Temporary Water Treatment Plant. The Response to Submissions Report notes that *"In the event that Hydro decides to proceed with construction and operation of an on site leachate treatment plant, Hydro would submit a detailed design for review and approval by the Department and the EPA"*.

Since submission of the Response to Submissions Report, Hydro has undertaken further review of the environmental and economic factors associated with onsite versus offsite treatment methods of leachate and has determined that temporary onsite treatment is preferred during the remediation works. A modification to the development consent for SSD 6666 is therefore required to enable the construction and operation of an onsite Temporary Water Treatment Plant and associated infrastructure, collectively called the Temporary Water Treatment System, and to enable discharge of the treated leachate to the existing water management system (the Modification).

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- Decommissioning of the Temporary Water Treatment System when leachate generation rates make the offsite treatment more suitable (forecast to be approximately 12 months after cell capping).

The proposed location of the onsite Temporary Water Treatment Plant is only about 200 metres northeast of the location shown in Appendix 25 of the Response to Submissions Report. It also requires a minor modification of the location of the one megalitre leachate storage dam near the Capped Waste Stockpile to accommodate the proposed relocation of the treatment plant. Relocating the treatment plant to directly adjacent to the dam removes the need for the connecting pipeline of 170 metres length.

Offsite treatment would be retained as a potential leachate treatment option: it would, however, only be used: when needed due to excessive leachate generation (actual or predicted), if the onsite treatment plant was unavailable for maintenance; and when leachate production levels are low enough to not warrant the operation of the onsite treatment plant.

A figure showing the location of the proposed Temporary Water Treatment System infrastructure is provided as an attachment to this letter. The location is consistent with the proposed location presented in the Response to Submissions Report. Further details on the Temporary Water Treatment System would be provided in the Statement of Environmental Effects to supporting the Modification Application.

A Statement of Environmental Effects (SEE) has been prepared in accordance with the Department of Planning, Industry and Environment *Modifying an Approved Project Draft Environmental Impact Assessment Guidance Series* (June 2017) to support the modification to the development consent for SSD 6666 under section 4.55(2) of the EP&A Act.

Section 4.55(2) of the EP&A Act allows for a development consent to be modified by the consent authority to which the original application was made, provided the modification is “*substantially the same development*” for which the consent was originally granted. The Modification is considered to be substantially the same development to the approved under SSD 6666 as:

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The key issues considered in the SEE include:

- Soil and water
- Hazards and risks
- Air quality and odour
- Noise and vibration
- Transport and access
- Visual
- Waste
- Biodiversity
- Heritage.

The SEE compares the potential impacts of the approved project under SSD 6666 to any changes that may occur as a result of the Modification and recommend any additional management and mitigation measures where required.

It should be noted that the remediation contract with Daracon includes the establishment and operation of the Temporary Water Treatment Plant and is reflected in the contract value and schedule. This is relevant due to the financial security requirements of the VPA. The value of the relevant project phases and corresponding bank guarantees already includes the temporary water treatment.

Hydro invites the Department of Planning, Industry and Environment to provide comment on the Modification, including confirmation that the described approach for the SEE for assessing the potential environmental impacts of the Temporary Water Treatment System would satisfy your requirements.

We are also consulting with the Environment Protection Authority directly to comment on the Modification. We will submit the Modification Application once we have completed this consultation and consider any raised in completing the SEE.

To allow us to complete the SEE and formally submit the Modification Application, we request that you respond by 8 February 2021.

Please feel free to give me a call should you wish to discuss or to arrange a meeting.

Yours sincerely

A handwritten signature in black ink, appearing to be 'S. Taylor', with a long horizontal line extending to the right.

**Shaun Taylor**

Senior Managing Consultant

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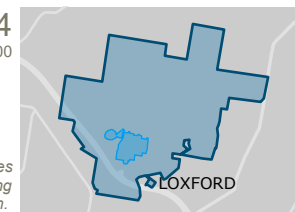
RAMBOLL AUSTRALIA - GIS MAP file : 318000533\_GIS\_P001\_RemediationEMP | F025\_LeachateMgmtV02\_V01 | 21/01/2021

Aerial photography by Nearmap, flown 15.06.2020

## Legend

- Project site
- Leachate storage dam
- Leachate treatment plant
- Leachate transfer pipeline
- ..... Clean water discharge

A4  
1:8,000



Ramboll Australia does not warrant that this document is definitive nor free of error and does not accept liability for any loss caused or arising from reliance upon information provided herein.



Mr Richard Brown  
Managing Director  
Hydro Aluminium Kurri Kurri Pty Ltd  
Hart Road  
LOXFORD NSW 2326

4 March 2021

Dear Mr Brown

Hydro Kurri Kurri Aluminium Smelter Remediation Mod-1 (SSD-6666-Mod-1)  
**Planning Secretary's Environmental Assessment Requirements**

Please find attached a copy of the Planning Secretary's environmental assessment requirements (SEARs) for the modification report for the modification application (SSD 6666-Mod 1). These requirements have been prepared in consultation with relevant public authorities based on the information you have provided to date.

Your modification application must address the SEARs (**Attachment 1**) and the requirements of the public authorities (**Attachment 2**). Please note that the Planning Secretary may modify these requirements at any time.

If you do not submit the modification application within two years, you must consult further with the Planning Secretary in relation to the preparation of the modification application.

The Department wishes to emphasise the importance of effective and genuine community consultation where a comprehensive open and transparent community consultation engagement process must be undertaken during the preparation of the modification application. This process must ensure that the community is provided with a good understanding of what is proposed, description of any potential impacts and they are actively engaged in issues of concern to them.

Please contact the Department at least two weeks before you propose to submit your modification application. This will enable the Department to confirm the applicable fee (see Division 1AA, Part 15 of the *Environmental Planning and Assessment Regulation 2000*).

If the modification application is likely to have a significant impact on matters of National Environmental Significance, it will require an approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This approval would be in addition to any approvals required under NSW legislation. It is your responsibility to contact the Commonwealth Department of Agriculture, Water and the Environment to determine if an approval under the EPBC Act is required (<http://www.environment.gov.au> or 6274 1111).

If you have any questions, please contact Sheelagh Laguna on 02 9274 6574 or via [sheelagh.laguna@planning.nsw.gov.au](mailto:sheelagh.laguna@planning.nsw.gov.au).

Yours sincerely,

A handwritten signature in black ink, appearing to read 'C. Rutledge'.

**as delegate for the Planning Secretary**

**Attachment 1: Planning Secretary's Environmental Assessment Requirements  
Hydro Aluminium Kurri Kurri Remediation (SSD-6666-Mod-1)**

- 1. Description of the modification**, including:
  - a detailed description of the proposed temporary water treatment system, including the capacity of leachate storage basins and water holding tanks
  - a description of the relationship with and changes to existing development and any staging
  - identification of conditions to be modified and proposed wording of any new or modified conditions
  - identification of any proposed variations to other licences and approvals.
- 2. Details of the existing site**, including:
  - a description of existing and approved development, including licences or statutory approvals that apply to these
  - a summary of the existing conditions of consent that would be relevant to the proposal
  - a summary of the existing environmental management and monitoring regime
  - detailed plans of the existing and proposed site layout and structures
  - a table detailing compliance with existing conditions of consent.
- 3. Assessment of the modification**, including:
  - a detailed assessment of the key issues specified below, the public authority requirements and any other significant issues identified by a risk assessment, which includes:
    - an assessment of all potential impacts of the proposed modification on the existing environment and measures to avoid, minimise, mitigate and/or manage these potential impacts, including proposals for adaptive management and/or contingency plans to manage any significant risks to the environment
    - an assessment of the potential impacts of all stages of the proposed modification, including decommissioning and any cumulative impacts with the existing site.
- 4. Strategic and statutory context**, including:
  - the need and justification for the proposed modification having regard to its location and impacts, the suitability of the site and the public interest;
  - consideration of all relevant legislation, strategies, environmental planning instruments, including identification for any inconsistencies
  - detailed justification the proposal is substantially the same development as the development to which consent was originally granted, as per s4.55(2) of the EP&A Act.
- 5. Soil and water**, including:
  - an assessment of potential surface and ground water impacts of construction, operation decommissioning of the water treatment plant, including full characterisation of leachate to be treated, the suitability of the water treatment plant to treat all pollutants and potential impact on the downstream receiving environment
  - detailed site water balance
  - details of proposed mitigation, management and monitoring measures.
- 6. Traffic**, including an assessment of the impact of changes in traffic movements due to the proposed modification.
- 7. Waste Management**, including:
  - a description of the waste streams that would be generated by the construction, operation and decommissioning of the water treatment plant
  - details of the waste management strategy for the construction and ongoing operational waste generated
- 8. Hazard and risk**, including an assessment of any changes to hazard and risk screening outcomes due to the proposed modification, in particular for human exposure to contaminated leachate.
- 9. Consultation** with relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners, particularly EPA and DPIE Water.
- 10.** A table indicating where each element of the SEARs is addressed should be included in the modification application.

## **Attachment 2: Public Authority Requirements**

## Input to SEARs SSD 6666 MOD 1 – Cessnock City Council

### Response History

#### Public Authority Response

Thursday, 11 February 2021 3:53:49 PM AEDT

Notes:

Dear Sheelagh

Cessnock City Council has reviewed the information associated with SSD 6666 Modification 1. Council has no objection to the modification.

If you have any questions in respect to this matter, do not hesitate to contact me on (02) 4993 4112.

Yours faithfully

Peter Giannopoulos

Team Leader Development Services



OUT21/1370

Sheelagh Laguna  
Planning and Assessment Group  
NSW Department of Planning, Industry and Environment

[sheelagh.laguna@planning.nsw.gov.au](mailto:sheelagh.laguna@planning.nsw.gov.au)

Dear Ms Laguna

**Hydro Kurri Kurri Aluminium Smelter Remediation Mod 1- Temporary Water Treatment Plant (SSD 6666)**  
**Comment on the Secretary's Environmental Assessment Requirements (SEARs)**

I refer to your email of 3 February 2021 to the Department of Planning, Industry and Environment (DPIE) Water and the Natural Resources Access Regulator (NRAR) about the above matter.

The following recommendations are provided by DPIE Water and NRAR.

The SEARS should include:

- The identification of an adequate and secure water supply for the life of the project. This includes confirmation that water can be sourced from an appropriately authorised and reliable supply. This is also to include an assessment of the current market depth where water entitlement is required to be purchased.
- A detailed and consolidated site water balance.
- Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts.
- Proposed surface and groundwater monitoring activities and methodologies.
- Consideration of relevant legislation, policies and guidelines, including the NSW Aquifer Interference Policy (2012), the Guidelines for Controlled Activities on Waterfront Land (2018) and the relevant Water Sharing Plans (available at <https://www.industry.nsw.gov.au/water>).

Any further referrals to DPIE Water & NRAR can be sent by email to:  
[landuse.enquiries@dpi.nsw.gov.au](mailto:landuse.enquiries@dpi.nsw.gov.au).

Yours sincerely

Alistair Drew  
Project Officer, Assessments  
**Water – Knowledge Office**  
8 February 2021



Our ref: DOC21/68105-10  
Your ref: Modification 1 to SSD 6666

Department of Planning and Environment  
Industry Assessments  
4 Parramatta Square  
PARRAMATTA NSW

By Email  
23 February 2021

Attention Ms Sheelagh Laguna

Dear Ms Laguna

**State Significant Development 6660 – Modification 1 – On Site Water Treatment Plant –  
Hydro Aluminium Smelter, Hart Road, Loxford**

I refer to your email dated 3 February 2021 requesting comment from the Environment Protection Authority (**EPA**) about Modification 1 to SSD 6666 (**the Modification**). The Modification seeks to enable the construction and operation of an onsite Temporary Water Treatment system and associated infrastructure; and to enable discharge of the treated leachate to the existing water management system.

The EPA has reviewed the information provided in the Draft Statement of Environmental Effects (**Draft SEE**) and requires further information prior to supporting the Modification. The EPA's comments are attached to this letter (**Attachment 1**).

If you have any questions about this matter, please contact Kasey Williams on phone 4908 6859.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'STEVEN JAMES', written over a circular stamp or logo.

**STEVEN JAMES**  
Unit Head, Regulatory Operations, Metro North  
Environment Protection Authority

# **Attachment 1**

## **A. Surface Water Assessment**

The EPA provides the following comments and requests further information so it can adequately assess potential surface water impacts associated with the Modification:

### **1. There is ambiguity surrounding relevant documentation referred to in the Draft SEE**

The Modification Report frequently refers to the EIS or RTS report for additional information.

There are over 50 RTS reports on the Major Projects Planning portal. Given the long history of the project, lengthy documents and multiple revisions, it is unclear what is still relevant (noting EIS water quality data from 2015 no longer represents contemporary data).

### **2. The current leachate influent quality is unknown**

The Modification Report does not characterise the current leachate quality. The most recent characterisation of the leachate appears to be in RTS Appendix 3 - Part 1's Containment Cell Design Report (1046 pages, August 2018) Appendix A Leachate Assessment. The characterisation is limited and based upon two sampling events from 2015.

### **3. It is unclear if the water treatment plant will treat all pollutants that are at non-trivial concentrations, and what effluent discharge quality will be**

The Draft SEE indicates the plant has been designed to treat conductivity, fluoride, cyanide, oils and grease, pH, total suspended solids and total dissolved solids. The applicant provides treatment criteria for these parameters however, no discharge concentrations are provided for conductivity or total suspended solids.

The suitability of the water treatment plant to treat all pollutants at non-trivial concentrations cannot be assessed unless the current leachate influent has been characterised. Historical groundwater reports suggest heavy metals (including aluminium, zinc and nickel), TRH, PAH's are also above the relevant guideline values ANZG (2018).

### **4. The receiving water quality in the North Dam is not clear**

Treated effluent will be discharged to the North Dam. The most recent water quality data in the Modification Report is from 2015. The Modification Report only mentions pH, cyanide and fluoride and it is unclear if the list of pollutants discussed are representative of all pollutants likely to be present at non-trivial concentrations.

The Modification Report indicates that water within the North Dam will be 'reused or irrigated to land in accordance with the EPL'. EPL 1548 contains "Discharge Point 11" (otherwise referred to as 'North Dam' within the RTS) and is permitted to discharge to the 'irrigation area' however there are no water quality criteria assigned.

The RTS Appendix 13 water balance (2018) indicates that the Northern Dam has had uncontrolled overflows three times between 2013-2016. There is no consideration of the potential impacts of these uncontrolled discharges on the downstream environment and whether further management measures are required to mitigate any identified impacts. The downstream receiving environment is Wentworth Swamp, which is mapped as potential habitat to threatened fish species.

The Draft SEE has not demonstrated that the water quality within the North Dam can be sustainably irrigated or considered the potential impacts of uncontrolled discharges to the downstream receiving environment.

## **5. The water treatment plant management systems are unclear**

The Draft SEE does not demonstrate that the leachate storage basins and treated water holding tanks are appropriately sized to contain leachate (such as during heavy rain, the water treatment plant being offline or poor effluent discharge quality).

**The EPA recommends that the applicant provides an updated, consolidated report that includes (at a minimum):**

- A contemporary characterisation of the influent leachate quality and the receiving water quality within the Northern Dam and downstream receiving environments for all pollutants likely to be present at non-trivial levels.
- The expected discharge quality from the Water Treatment Plant.
- The expected combined discharge quality from the Northern Dam (with the addition of WTP discharge) under a range of operational and climatic scenarios (e.g. wet weather, dry weather).
- An assessment of the potential impact of the proposed discharge (to both land and the downstream receiving environment) with reference to the appropriate guidelines, including but not limited to:
  - Australian & New Zealand Guidelines for Fresh and Marine Water Quality (ANZG (2018))
  - Environmental Guidelines: Use of Effluent by Irrigation (NSW DEC 2004)
- Demonstrates that the water treatment plant systems (leachate storage basins, treated water holding tanks) are appropriately sized.
- A water treatment plant validation monitoring program.
- A soil, surface and groundwater monitoring program that assesses controlled (via irrigation) and uncontrolled overflows from the North Dam.
- The practical measures that will be taken to prevent, control or mitigate pollution including contingencies that will be implemented if WQOs are not met.

## **B. Groundwater Assessment**

The EPA provides the following comments on the potential groundwater impacts associated with the Modification:

- The proponent has not justified that the leachate pond lining construction will be suitable to fully contain the leachate or enable suitable lining performance monitoring. Whilst a 2mm HDPE lining was noted, there is no supporting information demonstrating that this has been tested and found to be adequate to prevent leachate material from infiltrating the lining.
- The location of the proposed infrastructure is appropriate for achieving good environmental outcomes.
- If the ponds were suitably constructed, the rate of disposal or storage of leachate should be adequately managed.
- Any leaks from the pipeline, proposed to be double skinned in areas with the higher potential for impact, or buried under road crossings should be inspected manually and will be covered by existing licence conditions.
- The proponent has proposed weekly inspections of the TWTP, erosion and sediment controls, environment and containment measures, and containment cell transfer pipe. This should be adequate for the management of leachate for groundwater purposes.
- The proponent has proposed a continuation of groundwater monitoring. Though not used as monitoring points on EPL 1548, it is understood that the proponent conducts routine groundwater monitoring separate to the licence.

## **C. Waste and Contaminated Lands Assessment**

The EPA provides the following comments and requests further information so it can adequately assess potential impact from waste and land contamination associated with the Modification:

### **1. Managing leachate contaminated liquid generated at the premises**

The Draft SEE outlines that the “*Temporary Water Treatment System (TWTS) has been designed to manage all the leachate expected to be generated during the Project. Offsite treatment of leachate (as described in the RTS) could still occur if required where volumes may exceed the capacity of the onsite TWTS, such as following or during heavy rain events.*”

*Leachate within the Containment Cell Leachate Pond would be pumped out and transported to the Leachate Holding Pond via a HDPE pipe when:*

- *The pond reaches 85% capacity*
- *A heavy rain event is forecast.*

*A surface-laid 100 mm diameter high-density polyethylene (HDPE) pipe would be installed to transfer leachate from the Containment Cell Leachate Pond to the Leachate Holding Pond. The plant is designed to treat and discharge a maximum of 2,400 kL/month.*

*The modelling indicated that annual leachate generation is predicted to peak at approximately 1,948 kL per month during material placement, through to 3,884 kL in the first year following capping, before reducing to 388 L per year after five years of capping.”*

### **Recommendation**

The containment cell leachate pond and leachate holding pond do not appear to have been designed using a water balance for the operations. Instead it appears to be event based. It is not clear that the leachate containment and treatment system have enough capacity based on the limited information provided.

Whilst contingencies exist to truck the leachate from the site when the system is not able to contain/process the excess leachate; the system should be designed using a water balance for the proposed operations in accordance with the *Environmental Guidelines Solid Waste Landfills (2016)* and details provided on any anticipated shortfall for onsite containment and treatment.

### **2. Temporary Water Treatment System (TWTS)**

The leachate treatment system outlined in Table 2-1 is expected to remove the identified pollutants in the leachate when managed in accordance with the specifications of the provider.

### **Recommendation**

The proposed treatment system be adopted

### **3. Leachate Holding Pond construction**

The SSD 6666 Modification report outlines that “*the Leachate Holding Pond is to be constructed using validated fill material sourced from the Smelter Site and lined with 2 mm HDPE lining to contain the leachate.*”

### **Recommendation**

The limited details provided for the design and construction of the leachate holding pond are not adequate to assess the capacity to contain and manage the leachate generated.

It is recommended that:

- Leachate storage (design, construction and operation) be consistent with the technical specifications outlined in the *Environmental Guidelines Solid Waste Landfills (2016)*
- Before major construction works occur, the proponent prepares a Construction Quality Assurance Plan. This must set out the proposed testing, inspection and other verification procedures to be implemented during construction of the leachate containment works.
- Following construction, the occupier must prepare a Construction Quality Assurance Report on the quality assurance that was implemented to ensure that the works comply with the approved designs and specifications.

#### 4. Transfer pipe installation

The transfer pipe is to be constructed of 100 mm diameter HDPE piping and would be butt welded and surface laid. Where the pipeline is required to cross an access road it would be installed under the road. Where the pipe traverses the unnamed watercourse, it would be double skinned. The proponent has outlined that the integrity of the pipe will be checked weekly.

#### **Recommendation**

Transfer pipes are not usually banded and the required frequency for routine checks is adequate given the temporary nature of the works.

However, the transfer pipe should be pressure tested prior to commissioning to verify that there are no leaks.

#### 5. Monitoring Parameter Suite

The SSD 6666 Modification report outlines that “Once leachate has been treated, tested and approved for discharge, the water will be pumped into the Eastern Surge Pond and to the Smelter water management system.”

The proposed monitoring parameters are outlined in Table 2-3.

Table 2-3: Treated Leachate Target Values

Parameter	Units	Limit	Test Method	Frequency of Testing
Conductivity	µS/cm	None specified	Calibrated field meter	Daily
Fluoride	mg/L	15	APHA 4500-F-C	Weekly or minimum of 1 per 40,000 L
Free cyanide	mg/L	<0.005	APHA 4500 CN-O, ASTM D7237	Weekly or minimum of 1 per 40,000 L
Total oils and grease	-	No visual sheen	Visual	Daily
pH	-	6.5-8	Calibrated field meter	Daily
Total Suspended Solids (TSS)	mg/L	None specified	APHA 2540 C	Weekly or minimum of 1 per 40,000 L
Total Dissolved Solids (TDS)	mg/L	<50	Calibrated field meter	Daily

The range of parameters included in the monitoring suite is not expected to cover the expected range of contaminants. For example, the location where the leachate pond is to be sited is the former Anode Waste Pile and is an area of environmental concern containing polycyclic aromatic hydrocarbon (PAH) contamination in surface soils to 0.2 m below ground surface. These soils are to be placed in the containment cell and would therefore contribute to the leachate.

***Recommendation***

The monitoring suite be broadened to include Poly Aromatic Hydrocarbons, Total Recoverable Hydrocarbons and Heavy metals.

**6. Additional Issues****Geotube**

The waste sludge generated from the TWTS is to be processed in a Geotube. These tubes can leak, and spills and ruptures can occur.

***Recommendation***

That the Geotube containing sludge be in placed in a bunded/contained area.

**Spent Media**

The spent media from the TWTS is to be placed into the containment cell. This will be a concentrated waste stream which is likely to have high concentrations of contaminants.

***Recommendation***

Confirmation should be provided that the containment cell is suitably designed to manage these wastes.

**SEPP 55**

The EPA notes that SEPP 55 is not required in Table 3-4 of the Draft SEE and as such can be removed.

## Input to SEARs SSD 6666 MOD 1 – Water NSW

### Response History



#### Public Authority Response

Wednesday, 3 February 2021 5:55:05 PM AEDT

##### Notes:

Thank you for requesting WaterNSW's input relating to the request for Secretary's Environmental Assessment Requirements (SEARs) for the Modification 1 Temporary Water Treatment Plant. Please note that as the subject site is not located in close proximity to any WaterNSW land or assets, and as an SSD any flood works or licensing approvals will be assessed by others, the risk to water quality is considered to be low and WaterNSW has no comments or particular requirements.

Environment Protection Authority  
PO Box 488G  
Newcastle NSW 2300  
Attention: Kasey Williams

Dear Kasey

Date 10/05/2021

**State Significant Development 6666 – Modification 1 –  
Temporary Water Treatment Plant: response to EPA Comments**

Hydro Aluminium Kurri Kurri Pty Ltd (Hydro) has been provided the issues raised by the Environment Protection Authority (EPA) regarding the proposed Temporary Water Treatment Plant (TWTP) and associated infrastructure that would require a modification to the approved Hydro Remediation Project.

Table 1 lists the EPA's comments and Hydro's response, including where they have been addressed in the revised Draft Statement of Environmental Effects (SEE). To allow us to complete the SEE and adequately address the EPA's issues, we request that you confirm the adequacy of our response and the proposed approach to addressing these issues in the SEE.

Please feel free to give me a call to discuss.

Yours sincerely



**Shaun Taylor**  
Senior Managing Consultant

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Ref AS130401

Agency Issues	Hydro Response
<b>Surface Water Assessment</b>	
<p>The EPA recommends that the applicant provides an updated, consolidated report that includes (at a minimum):</p>	
<ul style="list-style-type: none"> <li>A contemporary characterisation of the influent leachate quality and the receiving water quality within the Northern Dam and downstream receiving environments for all pollutants likely to be present at non-trivial levels.</li> </ul>	<p>We have collected six samples from the North Dam and analysed for TRH/BTEX/PAH and metals. This information will be combined with the routine sampling of North Dams for PFAS, pH, EC and Fluoride and presented as an assessment of water quality conditions prior to receipt of treated leachate. Section 3.6.2.1 of the revised Draft SEE presents the target values for the North East Dam.</p> <p>Eleven samples of the Capped Waste Stockpile leachate have been collected and sampled on two occasions: in 2015 (to inform the Containment Cell Detailed Design) and 2019 (to inform the TWTP design). Section 3.1.1.1 of the revised Draft SEE presents this data.</p> <p>Further sampling of leachate in the CWS is not proposed as eleven samples are now collected and the range of contaminants and contaminant concentrations has been contemplated in the water treatment plant design. The concentrations in the actual leachate that will be treated are expected to be variable and depend on several factors including the waste types exposed during a rain event and the dilution effect of the rain event.</p> <p>The TWTP is therefore designed to accommodate a range of input characteristics and further sampling of leachate will not reduce the inherent uncertainty required to be incorporated in the WTP design. Sufficient information is available for the waste nature and the leachate characteristics to inform the types of contaminants requiring treatment design.</p>
<ul style="list-style-type: none"> <li>The expected discharge quality from the Water Treatment Plant</li> </ul>	<p>The TWTP discharge is batch based and water will be tested prior to release. Where water quality is not met, water will be either re-treated or taken off site by a licensed waste contractor for disposal.</p> <p>Section 3.6.2 of the revised Draft SEE presents the treated leachate target values.</p>

Agency Issues	Hydro Response
<ul style="list-style-type: none"> <li>The expected combined discharge quality from the Northern Dam (with the addition of WTP discharge) under a range of operational and climatic scenarios (e.g. wet weather, dry weather)</li> </ul>	<p>Section 3.6.2.1 of the revised Draft SEE presents the target values for the North East Dam. This will apply to any discharges, including when the dam has received discharges from the TWTP.</p> <p>Water quality of the North East Dam improves with rainfall and it is following these events that discharge to the irrigation area is required to be utilised. During dry periods irrigation will not occur. Water from the North East Dam will be preferentially used on site for dust suppression during the project. The volumes of water required for dust suppression is estimated at 4 ML/month. This compares to 1.4 ML/month historically discharge to the irrigation area.</p>
<ul style="list-style-type: none"> <li>An assessment of the potential impact of the proposed discharge (to both land and the downstream receiving environment) with reference to the appropriate guidelines, including but not limited to: <ul style="list-style-type: none"> <li><i>Australian &amp; New Zealand Guidelines for Fresh and Marine Water Quality</i> (ANZG (2018))</li> <li><i>Environmental Guidelines: Use of Effluent by Irrigation</i> (NSW DEC 2004)</li> </ul> </li> </ul>	<p>Irrigation of water from the site to the irrigation area has occurred over the duration of the smelter operations. No impacts to soil, vegetation, or downstream surface water from the irrigation of this area have been identified. The Modification would continue to irrigate water of a consistent quality and amount to that historically applied and consequently no impact from this activity is likely.</p> <p>This is addressed in Section 6.1.2 of the revised Draft SEE.</p>
<ul style="list-style-type: none"> <li>Demonstrates that the water treatment plant systems (leachate storage basins, treated water holding tanks) are appropriately sized</li> </ul>	<p>The TWTP is designed based on the modelled leachate generation for the site using peak rainfall conditions. However, additional leachate storage is incorporated in the waste cells themselves. The TWTP design includes two 1 ML leachate storage ponds. These are supplemented by a combined in-cell holding capacity of 1.3ML at both the Containment Cell and the Capped Waste Stockpile (the amount at each location changing over time with material removal and relocation).</p> <p>The Detailed Design Report (GHD, 2018) estimated that the highest leachate generation rate would be 1.8ML/ month, resulting in more than two months of storage of untreated leachate available at this maximum rate.</p> <p>In the event of an extreme event, additional storage within the Containment Cell and Capped Waste Stockpile is available, however this would mean flooding of waste within the Containment Cell.</p> <p>However, the TWTP is designed to treat 2.4ML/ month and would therefore have sufficient capacity to avoid the need to use the Containment Cell and Capped Waste Stockpile themselves for storage.</p>

Agency Issues	Hydro Response
	<p>If a significant rain event is forecast, the following would be implemented (as required) to maintain storage capacity:</p> <ul style="list-style-type: none"> <li>• Continuous operation of the TWTP at its maximum available capacity</li> <li>• Transport leachate for off site treatment</li> </ul> <p>This is addressed in Section 3.1.2 of the revised Draft SEE.</p>
<ul style="list-style-type: none"> <li>• A water treatment plant validation monitoring program.</li> </ul>	<p>Attached is the Inspection and Test Plan (ITP) for the TWTP. This includes batch testing prior to release of treated leachate. Monitoring of the North East Dam will continue in accordance with the Soil and Water Management Plan.</p>
<ul style="list-style-type: none"> <li>• A soil, surface and groundwater monitoring program that assesses controlled (via irrigation) and uncontrolled overflows from the North Dam.</li> </ul>	<p>Hydro currently monitors water quality of the receiving environment in accordance with the Soil and Water Management Plan. This monitoring is proposed to continue throughout the construction program. As there are no additional impacts predicted from the discharge of treated water to the North East Dam the existing monitoring program, which has not identified any impacts from the historical use of the irrigation area, is considered an appropriate monitoring program for the proposal.</p> <p>Monitoring of batch discharge prior to release to the North East Dam will form part of the TWTP monitoring program. Monitoring of EC, pH and Fluoride in the North East Dam will continue monthly in accordance with the current program.</p>
<ul style="list-style-type: none"> <li>• The practical measures that will be taken to prevent, control or mitigate pollution including contingencies that will be implemented if WQOs are not met</li> </ul>	<p>As noted above, as there are no additional impacts predicted from the discharge of treated water to the North East Dam no management for occasional discharge from the North East Dam is considered to be required.</p> <p>This is addressed in Section 3.2, Section 3.6 and Section 6.1.3 of the revised Draft SEE.</p>

Agency Issues	Hydro Response
<p><b>Groundwater Assessment</b></p> <p>The proponent has not justified that the leachate pond lining construction will be suitable to fully contain the leachate or enable suitable lining performance monitoring. Whilst a 2mm HDPE lining was noted, there is no supporting information demonstrating that this has been tested and found to be adequate to prevent leachate material from infiltrating the lining.</p>	<p>The HDPE 2mm lining will be the same as that to be used in the Containment Cell construction. As noted in Appendix E of the Containment Cell Detailed Design Report (GHD, 2018) that was presented as Appendix 3 to the Response to Submissions Report, this liner was selected following extensive testing using leachate extracted from the Capped Waste Stockpile. As the Leachate Storage Pond would store such leachate, the HDPE lining would be adequate.</p> <p>This is addressed in Section 3.5.2.1 of the revised Draft SEE.</p>
<p><b>Waste and Contaminated Lands Assessment</b></p>	
<p><b>Managing leachate contaminated liquid generated at the premises</b></p> <p>The containment cell leachate pond and leachate holding pond do not appear to have been designed using a water balance for the operations. Instead it appears to be event based. It is not clear that the leachate containment and treatment system have enough capacity based on the limited information provided.</p> <p>Whilst contingencies exist to truck the leachate from the site when the system is not able to contain/process the excess leachate, the system should be designed using a water balance for the proposed operations in accordance with the Environmental Guidelines Solid Waste Landfills (2016) and details provided on any anticipated shortfall for onsite containment and treatment</p>	<p>The design of the Containment Cell Leachate Pond and Leachate Holding Pond form part of the Detailed Design Report prepared by GHD (2018). Appendix C of the report (Leachate Management Options Assessment Report) included consideration of predicted leachate quantity. This included modelling of leachate generated during excavation of the Capped Waste Stockpile and the various stages of construction, filling and completion of the Containment Cell. The modelling considered two rainfall scenarios:</p> <ul style="list-style-type: none"> <li>• A 50% Annual Exceedence Probability (AEP) rainfall year (mean rainfall)</li> <li>• A 90% AEP rainfall year (high rainfall)</li> </ul> <p>Consideration of rainfall events rather than a conventional water balance was considered more applicable for the Containment Cell as the material in the Capped Waste Stockpile (and to be placed in the Containment Cell) are not leachate generating (non-putrescible) and so leachate generation is driven by rainfall. The ability for the ponds (as well as the storage available in the Containment Cell and the Capped Waste Stockpile for extreme events) to handle high rainfall is considered the critical driver for storage capacity.</p> <p>This is addressed in Section 3.1.2.3 of the revised Draft SEE.</p>

Agency Issues	Hydro Response
<b>Leachate Holding Pond construction</b>	
<p>The limited details provided for the design and construction of the leachate holding pond are not adequate to assess the capacity to contain and manage the leachate generated.</p> <p>It is recommended that:</p>	<p>It should be noted that the leachate storage infrastructure forms part of the Project approved under the development consent for SSD 6666. Details on their design and construction were provided in the Response to Submissions.</p>
<ul style="list-style-type: none"> <li>Leachate storage (design, construction and operation) be consistent with the technical specifications outlined in the <i>Environmental Guidelines Solid Waste Landfills</i> (2016)</li> </ul>	<p>The Detailed Design Report prepared by GHD (2018) (which forms part of the approved project documentation) noted that in preparing their designs (including leachate storage) they relied upon the <i>Environmental Guidelines Solid Waste Landfills</i> (2016). This is addressed in Section 3.1.2.3 of the revised Draft SEE.</p>
<ul style="list-style-type: none"> <li>Before major construction works occur, the proponent prepares a Construction Quality Assurance Plan. This must set out the proposed testing, inspection and other verification procedures to be implemented during construction of the leachate containment works.</li> </ul>	<p>Under the Voluntary Planning Agreement (VPA) that Hydro has entered into with the Department of Planning, Industry and Environment, an Independent Engineer (IE) is to be commissioned. The VPA and the IE Deed describes the responsibilities of the IE. These responsibilities include the inspection and verification of the Leachate Holding Pond, which has been approved under the development consent for SSD 6666. This is addressed in Section 3.4 of the revised Draft SEE.</p>
<ul style="list-style-type: none"> <li>Following construction, the occupier must prepare a Construction Quality Assurance Report on the quality assurance that was implemented to ensure that the works comply with the approved designs and specifications.</li> </ul>	<p>As part of their responsibilities under the VPA and the IE Deed, the IE will be required to prepare a Construction Quality Assurance Report. This is addressed in Section 3.4 of the revised Draft SEE.</p>
<b>Transfer pipe installation</b>	
<p>Transfer pipes are not usually banded and the required frequency for routine checks is adequate given the temporary nature of the works. However, the transfer pipe should be pressure tested prior to commissioning to verify that there are no leaks.</p>	<p>Noted. We will include a commitment in the SEE that the transfer pipe would be pressure tested prior to commissioning. This is addressed in Section 3.5.2.2 of the revised Draft SEE.</p>
<b>Monitoring Parameter Suite</b>	
<p>The monitoring suite be broadened to include Poly Aromatic Hydrocarbons, Total Recoverable Hydrocarbons and Heavy metals.</p>	<p>The monitoring to be undertaken of the treated water prior to discharge will also include TRH, BTEX, PAH and metals.</p> <p>This is addressed in Section 3.1.1.1, Section 3.6.2 and Section 6.1.3 of the revised Draft SEE.</p>

Agency Issues	Hydro Response
<b>Additional Issues</b>	
<b>Geotube</b>	
<p>The waste sludge generated from the TWTS is to be processed in a Geotube. These tubes can leak, and spills and ruptures can occur.</p> <p>That the Geotube containing sludge be in placed in a bunded/contained area.</p>	<p>This is noted. The TWTP, including the Geotubes containing sludge, would be contained within a bunded area.</p> <p>This is addressed in Section 3.1.4 of the revised Draft SEE.</p>
<b>Spent Media</b>	
<p>The spent media from the TWTS is to be placed into the containment cell. This will be a concentrated waste stream which is likely to have high concentrations of contaminants.</p> <p>Confirmation should be provided that the containment cell is suitably designed to manage these wastes.</p>	<p>The spent media would contain contaminants that are present within the Capped Waste Stockpile and other contaminated materials that will be placed in the Containment Cell. As the cell has been designed based on these contaminants the Containment Cell would manage these wastes.</p> <p>This is addressed in Section 3.3 and Section 6.7 of the revised Draft SEE.</p>

# INSPECTION AND TEST PLAN ITP 4000

<b>Project title:</b> HAKK Leachate TWTP			<b>Project No:</b> 105079		
<b>Description of activity:</b> Process Proving		<b>Contract No/Ref:</b>		<b>ITP No.</b> ITP 4000	<b>Rev No.</b>
<b>Site Location for inspection/testing:</b> Loxford, NSW			<b>Lot No:</b>		
<b>ITP prepared by:</b> P. Puddefoot		<b>Date:</b> 20/04/2021		<b>ITP approved by:</b>	
				<b>Date:</b>	

ID #	Process Step	Stage / Frequency	State Quality Acceptance Criteria:	Inspection Test Procedure	Records of Inspection or Test (s)	Inspection/Test Responsibility			Date Inspected*	Comments or NCR	Signed (EPS)	Client Signed (if client witness point)
						Worker /Work group	EPS	Client				
1.	Prepare Chemical Tanks for filling	After completion of wet commissioning	-Tanks drained of water after wet commissioning. -Consult SDS for each chemical, and adopt PPE control measures. -Hazardous Materials spill kit on hand in case of spill. -Filling in accordance to AS 3780-2008 The storage and handling of corrosive substance & NSW Dangerous Goods Code of Practice 2005	-Drain and check tanks are empty. -Correct PPE is worn. - Spill kit available		SM / SS / PE	D					
2.	Fill Chemical Tanks	Prior to Process Proving	-Piping is connected in a way to avoid leaking of chemicals -Tanks filled with Chemicals	-Inspect piping and connections prior to dispensing chemicals. -Fill with chemicals.		PE	D					
3.	Connect Raw Water supply to the TWTP	Prior to Process Proving	- Sample raw water for analysis of inlet parameters – determine dilution required to meet design spec. for raw water feed to TWTP	- Water analysis by NATA accredited lab		PE	D					

**Records of Inspection or Test Legend:** List Inspection and Test Report Type. \* For activities with multiple frequencies write date of initial inspection. Those Items requiring multiple inspections should be documented on a separate ITR.

**Inspection/Test Responsibility Legend:** X = Worker or workgroup self-inspection; H = Hold Point; D = Document; R = Review; V = Visual; W = Witness; C = Consultant responsibility to EPS

# INSPECTION AND TEST PLAN ITP 4000

ID #	Process Step	Stage / Frequency	State Quality Acceptance Criteria:	Inspection Test Procedure	Records of Inspection or Test (s)	Inspection/Test Responsibility			Date Inspected*	Comments or NCR	Signed (EPS)	Client Signed (if client witness point)
						Worker /Work group	EPS	Client				
4.	Determine Dosing Control settings to LDAF	During Process Proving	-Sulphuric Acid dose rate established and set - Coagulant dose rate established and set - Polymer dose rate established and set -Oxidant dose rate established and set - Alkali dose rate established and set	-Run raw water leachate through WTP. -Adjust scaling to achieve desired chemical dosing - record all dosing setpoints		PE	D					
5.	Treat first 20kL batch of leachate	After chemical dosing optimisation	-Treatment process operating as per design	- Treat 20kL batch - Water analysis by NATA accredited lab		PE	D					
6.	Treat second 20kL batch of leachate	After batch 1	-Treatment process operating as per design	- Treat 20kL batch - Water analysis by NATA accredited lab		PE	D					
7.	Treat third 20kL batch of leachate	After batch 2	-Treatment process operating as per design	- Treat 20kL batch - Water analysis by NATA accredited lab		PE	D					

**Records of Inspection or Test Legend:** List Inspection and Test Report Type. \* For activities with multiple frequencies write date of initial inspection. Those Items requiring multiple inspections should be documented on a separate ITR.

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## INSPECTION AND TEST PLAN ITP 4000

ID #	Process Step	Stage / Frequency	State Quality Acceptance Criteria:	Inspection Test Procedure	Records of Inspection or Test (s)	Inspection/Test Responsibility			Date Inspected*	Comments or NCR	Signed (EPS)	Client Signed (if client witness point)
						Worker /Work group	EPS	Client				
8.	Record all process proving setpoints	After Process proving	-All setpoints recorded	Inspect final state and record		PE	D					
9.	Process Proving complete	After 3 successful batches treated	-All Process Commissioning tasks completed and action items closed out . -Lab results from all three batches treated consistently meet the discharge criteria adopted	-Review results and confirm process is successfully treating to discharge criteria		Commissioning Manager	D	H				

**Records of Inspection or Test Legend:** List Inspection and Test Report Type. \* For activities with multiple frequencies write date of initial inspection. Those Items requiring multiple inspections should be documented on a separate ITR.

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AMENDMENTS			
No.	Description of amendment made	Date	Approved by PM (sign)

PERSONNEL COMPLETING THIS ITP				
No	EPS Rep Name	Date	Position	Signature

**Records of Inspection or Test Legend:** List Inspection and Test Report Type. \* For activities with multiple frequencies write date of initial inspection. Those Items requiring multiple inspections should be documented on a separate ITR.

**Inspection/Test Responsibility Legend:** X = Worker or workgroup self-inspection; H = Hold Point; D = Document; R = Review; V = Visual; W = Witness; C = Consultant responsibility to EPS

Specifications and Australian Standards	
AS 3780-2008 The storage and handling of corrosive substances	NSW Dangerous Goods codes of Practice 2005
AS 1319-1994 Australian Standard Safety signs for the occupational environment	
AS 1345-1995 Identification of the contents of pipes, conduits and ducts	
AS 1216-2006 Class labels for dangerous goods	
Australian Code for the Transport of Dangerous Goods by Road and Rail Edition 7.4	

**Records of Inspection or Test Legend:** List Inspection and Test Report Type. \* For activities with multiple frequencies write date of initial inspection. Those Items requiring multiple inspections should be documented on a separate ITR.

**Inspection/Test Responsibility Legend:** X = Worker or workgroup self-inspection; H = Hold Point; D = Document; R = Review; V = Visual; W = Witness; C = Consultant responsibility to EPS

**From:** [Kasey Williams](#)  
**To:** [Shaun Taylor](#)  
**Cc:** [Hamish Rutherford](#)  
**Subject:** RE: Hydro Aluminium Proposed Temporary Water Treatment Plant Modification Application: Response to EPA Comments  
**Date:** Wednesday, 19 May 2021 10:26:35 AM  
**Attachments:** [image001.png](#)  
[image002.jpg](#)

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Hi Shaun,

Thanks again for your time this morning.

Just to confirm the points from our chat:

- The EPA has acknowledged Hydro's comments in response to the proposed TWTP. These comments should be responded to by our EPA technical branches, and as such this should be submitted formally to Planning to be allocated accordingly.
- Acknowledging Hydro's acceptance of the revised Draft Licence Variation, I will get this finalised and issued to you shortly.
- Whilst Hydro is occupying and conducting scheduled activities at 72 Hart Road, we are happy for the Premises information to remain the same on the Licence. I have your letter on file with comments in case another officer picks this up in the future. As discussed, once blocks of land are ready to be relinquished, we can amend the Licence accordingly.

If anything pops up in the meantime, don't hesitate to reach out.

Cheers,

**Kasey Williams**

**Operations Officer**

**Regulatory Operations – Metro North**

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*The EPA acknowledges the traditional custodians of the land and waters where we work. As part of the world's oldest surviving culture, we pay our respect to Aboriginal elders past, present and emerging.*

Report pollution and environmental incidents 131 555 or +61 2 9995 5555

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**From:** Shaun Taylor <staylor@ramboll.com>

**Sent:** Monday, 10 May 2021 1:03 PM

**To:** Kasey Williams <kasey.williams@epa.nsw.gov.au>

**Cc:** Hamish Rutherford <Hamish.Rutherford@epa.nsw.gov.au>

**Subject:** Hydro Aluminium Proposed Temporary Water Treatment Plant Modification

Application: Response to EPA Comments

Hi Kasey and Hamish,

Please find attached Hydro's response to the EPA's comments regarding the proposed Temporary Water Treatment Plant (TWTP) and associated infrastructure that would require a modification to the approved Hydro Remediation Project. I have also attached the revised Draft Statement of Environmental Effects, which also addresses your comments.

Hydro requests that you review and confirm if the proposed response and provided information addresses the EPA's comments.

Please feel free to call to discuss.

Kind regards

**Shaun Taylor**

Senior Managing Consultant

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[staylor@ramboll.com](mailto:staylor@ramboll.com)

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**From:** [DPI Landuse Enquiries Mailbox](#)  
**To:** [Shaun Taylor](#)  
**Subject:** RE: Hydro Kurri Kurri Aluminium Smelter Remediation Mod 1- Temporary Water Treatment Plant (SSD 6666): Consultation  
**Date:** Monday, 7 June 2021 12:01:26 PM

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Hi Shaun,

Thank you for your email.

DPIE Water and NRAR will review the information in detail when the modification report is sent to us by DPIE Planning & Assessment.

Regards,

**Judy Court**

**Assistant Project Officer**

Water Group | Department of Planning, Industry and Environment

T 9842 8126 | E [judy.court@dpie.nsw.gov.au](mailto:judy.court@dpie.nsw.gov.au)

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**Our Vision:** Together, we create thriving environments, communities and economies

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**From:** Shaun Taylor <[staylor@ramboll.com](mailto:staylor@ramboll.com)>

**Sent:** Friday, 4 June 2021 10:50 AM

**To:** DPI Landuse Enquiries Mailbox <[landuse.enquiries@dpie.nsw.gov.au](mailto:landuse.enquiries@dpie.nsw.gov.au)>

**Subject:** Hydro Kurri Kurri Aluminium Smelter Remediation Mod 1- Temporary Water Treatment Plant (SSD 6666): Consultation

Good morning,

On 8 February 2021 the Department of Planning, Industry and Environment (DPIE) Water responded to an email from DPIE dated 3 February 2021 regarding the proposed modification to the development consent for SSD 6666 (the Hydro Remediation Project). The modification is for a proposed temporary water treatment plant (TWTP).

Hydro Aluminium Kurri Kurri Pty Ltd (Hydro) and Ramboll has reviewed the issues raised in your letter as to what the SEARs should include. The following table lists these issues and our proposed response.

DPIE Water	Hydro response
The identification of an adequate and secure water supply for the life of the project. This includes confirmation that water can be sourced from an appropriately authorised and reliable supply. This is also to include an assessment of the current market depth where water entitlement is required to be purchased.	No water supply is required for the TWTP. Therefore no assessment is required.
A detailed and consolidated site water balance.	This will be provided in the Modification Report.
Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent	The Modification does not require direct impacts on groundwater or surface water. The leachate storage ponds (which form part of the approved project) have been designed and would be constructed in accordance with relevant EPA guidelines.

ecosystems, and measures proposed to reduce and mitigate these impacts	The Modification Report does include an assessment of potential indirect impacts on surface water and groundwater. The Modification does not require, or would lead to, disturbance of watercourses, riparian land, water supply infrastructure, or any landholder rights
Proposed surface and groundwater monitoring activities and methodologies.	The Modification Report would describe the surface and groundwater monitoring activities.
Consideration of relevant legislation, policies and guidelines, including the NSW Aquifer Interference Policy (2012), the Guidelines for Controlled Activities on Waterfront Land (2018) and the relevant Water Sharing Plans	The identified policies are not considered applicable as the proposal would not impact on aquifers, include activities on waterfront land, or use water from watercourses. The Modification Report would address the relevant legislation.

Could you please confirm by **Friday 11 June 2021** that our responses addresses DPIE Water's issues. Please feel free to give me a call to discuss.

Kind regards

**Shaun Taylor**

Senior Managing Consultant

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