Alcoa of Australia Limited

Environmentally Hazardous Materials Management Plan

Huntly & Willowdale Mine

Version	Description of Changes	Date
V1	Issued for submission	20/06/2024

Contents

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Abbreviations

ABBREVIATION	DESCRIPTION
AFFF	Aqueous Film-Forming Foams
ANZECC	Australian and New Zealand Environment and Conservation Council
AS	Australian Standard
BOD	Biological Oxygen Demand
CEO	Chief Executive Officer
CWTF	Controlled Waste Tracking Form
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety
DG	Dangerous Goods
DoH	Department of Health
DSI	Detailed Site Investigation
DWER	Department of Water and Environmental Regulation
EHMMP	Environmentally Hazardous Materials Management Plan
EHS	Environment, Health and Safety
EP Act	Environmental Protection Act
EPA	Environmental Protection Authority
HUN	Huntly mine
LMS	Learning Management System
LOC	Loss of Containment
ML1SA	Mineral Lease 1SA
MMP	Mining and Management Program
MMPLG	Mining and Management Program Liaison Group
OCA	Operational Control Area
PDWSA	Public Drinking Water Source Area
PFAS	Per- and polyfluoroalkyl substances
RPZ	Reservoir Protection Zone
TK-N	Total Kjeldahl nitrogen
WA	Western Australia
WDL	Willowdale mine

Definitions

Term	Definition
Clearing for mining	Removing native vegetation from the mining area in readiness for stripping of topsoil.
Drainage failure	Stormwater overflow within OCA – Zone 1, OCA – Zone 2, or Proclaimed Catchment
Drainage incident	a) a runoff from a disturbance area to the surrounding environment of surface water that has a turbidity of at least 25 nephelometric turbidity units for a period of at least 1 hour; or b) a discharge from containment infrastructure that includes or may include environmentally hazardous material.
Exploration	Activities carried out in search of minerals, including (without limitation) a) mapping; and b) surveying; and c) drilling; and d) the collection and assaying of soil, rock, groundwater and mineral samples; and e) other activities involving the application of 1 or more of the geological sciences;
Environmentally Hazardous Material	A material which by its characteristics poses a threat or risk to public health, safety or the environment, including but not limited to material that is a) toxic; or b) infectious; or c) mutagenic; or d) carcinogenic; or e) teratogenic; or f) explosive; or g) flammable; or h) Corrosive; or i) Oxidising j) radioactive.
Loss of Containment	Spill associated with an environmentally hazardous material.
Mining activities	a) extraction and processing of bauxite from mineral reserves below the surface of the earth, including but not limited to — (i) the removal of topsoil and overburden; and (ii) blasting, ripping or otherwise breaking caprock to expose bauxite; (iii) removal of bauxite; (iv) crushing of bauxite; (v) transport of bauxite to a refinery; and b) activities that are preparatory to, incidental to or consequential upon extraction and processing of bauxite, including but not limited to — (i) exploration; and (ii) land clearing; and (iii) the construction or maintenance of mining infrastructure; and (iv) rehabilitation.
Rehabilitation	In relation to an area that has been disturbed, includes — a) stabilisation of the area; and b) restoration of the landforms of the area to a state that is as close as practicable to their original undisturbed state; and c) the return of the native vegetation of the area to a state that is as close as practicable to its original undisturbed state.
Stabilisation	In relation to an area that has been disturbed, means carry out landscaping, ripping and other appropriate operations to prevent erosion of sediment, promote infiltration and manage surface water runoff.

1 Executive Summary

This Environmentally Hazardous Materials Management Plan (EHMMP) has been prepared for Huntly (HUN) and Willowdale (WDL) bauxite mines located within Alcoa's Mining Lease 1SA (ML1SA). The EHMMP is designed to be the framework for the management of environmentally hazardous materials at HUN and WDL.

This EHMMP has been prepared in accordance with the requirements of the approved 2023 – 2027 Mining and Management Program (MMP) Ministerial conditions 4(b), 4(d), 15(b), 17(e), 18, and 19 and to which the exemption from s. 41A is subject to Schedule 1, Division 2, cl. 6 outlined in the *Environmental Protection (Darling Range Bauxite Mining Proposals) Exemption Order 2023* and in accordance with Environmental Protection Authority, Instructions: How to prepare Environmental Protection Act 1986 Part IV environmental management plans (March 2024).

Table 1-1 details the Project summary, purpose and key environmental objective to be met through implementation of this EHMMP, including the environmental criteria and management targets to measure achievement of the associated environmental objectives during the active operational mining cycles (including exploration, construction, and mining; excluding rehabilitation and closure management).

Table 1-1: Summary of the Project and EHMMP Purpose and Environmental Provisions

Proposal name	Bauxite mining on the Darling Range in the southwest of Western Australia (WA) for the years 2023 to 2027.
Proponent name	Alcoa of Australia Limited (Alcoa)
Conditions/ Commitments	Environmental Protection (Darling Range Bauxite Mining Proposal) Exemption Order 2023, SL 2023/200. (14 December 2023). Ministerial Approval conditions for the 2023 – 2027 Mining and Management Program, Appendix A. (20 December 2023).
Ministerial Statement number/s	Willowdale Mine (Wagerup Refinery): • Ministerial Statement 1157 (preceding statements: 728, 897, 1069) • Ministerial Statement 646 Huntly Mine (Kwinana and Pinjarra Refinery): • Ministerial Statement 646
State Agreements	• *Alumina Refinery (Kwinana) Agreement Act 1961* • *Alumina Refinery (Wagerup) Agreement Act and Acts Amendment Act 1978* • *Alumina Refinery (Pinjarra) Agreement Act 1969* • *Alumina Refinery Agreements (Alcoa) Amendment Act 1987*
Purpose of this EMP	Describe Alcoa's management of environmentally hazardous materials at the Huntly and Willowdale bauxite mines to avoid and minimise discharge outside of containment infrastructure in accordance with the objective of condition 4(b) of the Ministerial Approval Conditions for the 2023-2027 Mining and Management Program.
Key Environmental Objectives and Outcomes	• Minimise impact to public drinking water supply. • Minimise impact to biological diversity. • Avoid or otherwise minimise discharge of environmentally hazardous material outside of containment infrastructure.
Condition Clause	4(b) *avoiding or otherwise minimising discharge of environmentally hazardous material outside of containment infrastructure.*
Proposed Construction Date	N/A – Operational

2 Context, Scope and Rationale

The operations at Huntly and Willowdale mines include the storage, use, and transportation of environmentally hazardous materials such as hydrocarbons and ethylene glycols (but not limited to) to perform bauxite mining, operate equipment, and perform maintenance related activities. Along with hydrocarbons and ethylene glycols, the management of legacy per- and polyfluoroalkyl substances (PFAS) are described within this EHMMP (Section 2.4.1), as PFAS containing aqueous film-forming foams (AFFF) were utilised at Huntly and Willowdale mine from approximately 2014 to 2021. In 2021, Willowdale and Huntly mines ceased the storage and use of PFAS compounds, including AFFF, and implemented management measures in relation to legacy risk.

This EHMMP has been prepared by Alcoa for the Huntly and Willowdale bauxite mine regions located within Alcoa's ML1SA and covers all phases of active, operational mining cycles (including exploration, construction, and mining; excluding rehabilitation and closure management). This EHMMP has been developed to address the management of environmentally hazardous materials, which by its characteristics poses a threat or risk to public health, safety or the environment, in accordance with relevant documents, such as:

- 2023-2027 Mining and Management Program (2023-2027 MMP) and associated approval conditions
- *Environmental Protection (Darling Range Bauxite Mining Proposals) Exemption order 2023*
- Instructions on how to prepare *Environmental Protection Act 1986* Part IV Environmental Management Plans (EPA 2024).

This EHMMP describes the procedures and management actions that will be undertaken to ensure that potential impacts to public health, safety or the environment that may result from Project activities have been avoided and minimised. This EHMMP is subject to approval by the State Development Minister. The following are key environmental objectives of this EHMMP that have been developed in accordance with *Statement of environmental principles, factors, objectives and aims of Environmental Impact Assessment (EIA)*, (EPA, 2023):

- To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected;
- To protect human health from significant harm;
- To protect flora and vegetation so that biological diversity and ecological integrity are maintained;
- To protect terrestrial fauna so that biological diversity and ecological integrity are maintained; and
- To maintain the equality of land and soils so that environmental values are protected.

2.1 Huntly and Willowdale Mine Regions

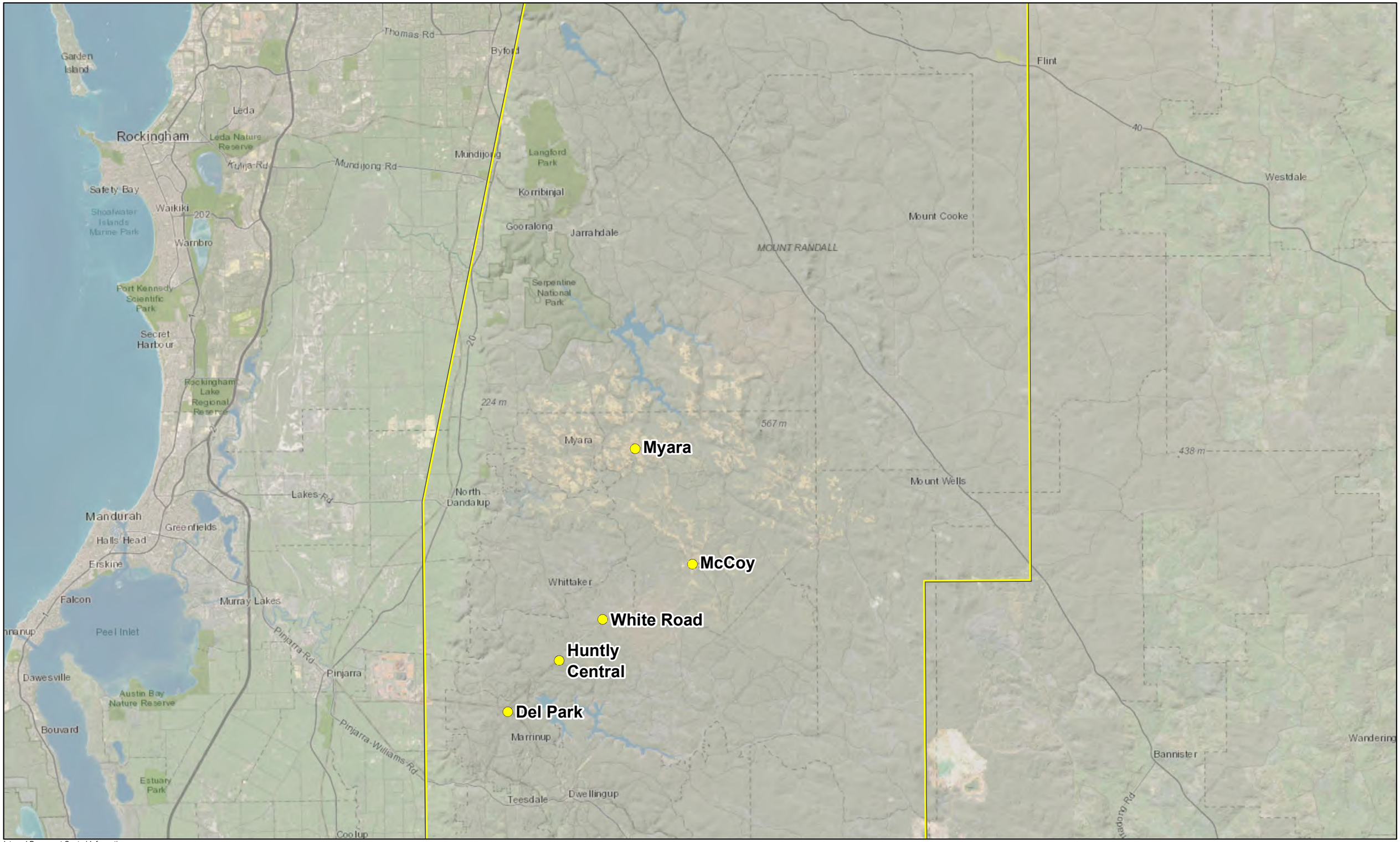
Alcoa's Western Australian (WA) mining operation is comprised of the Huntly and Willowdale mines, located within ML1SA. To the north of the Huntly mine (Myara North Region) lies the former Jarrahdale mine, which operated from 1963 – 1998 and is now closed and rehabilitated and is not considered under this EHMMP.

Huntly Mine

The Huntly mine (**Figure 2-1**) is primarily located within the Shire of Serpentine Jarrahdale and the Shire of Murray and extends from Dwellingup in the south to Jarrahdale in the north. This mine lies within Dwellingup and Jarrahdale State Forest and is broadly bordered by Serpentine National Park and the Darling Scarp to the west, the Monadnocks Conservation Park and Albany Highway to the east, Dwellingup and Pinjarra-Williams Road to the south and the former Jarrahdale Mine to the north. The mine supplies bauxite to the Kwinana and Pinjarra alumina refineries and has been in operation since 1972 over six mine regions (Del Park, Huntly 1 & 2, White, McCoy, O'Neil and Myara), with a further two regions proposed (Myara North and Holyoake).

Willowdale Mine

The Willowdale mine (**Figure 2-2**) is located within the Shire of Waroona and the Shire of Harvey and is broadly bordered by Lane Pool Reserve in the east and north-east, the Darling Scarp to the west and Harvey Dam and surrounding rural land to the south-east. The mine predominantly lies within Dwellingup State Forest and Lane Pool Reserve. The mine supplies bauxite to the Wagerup alumina refinery and has been in operation since 1984 and is comprised of three mine regions (Arundel, Orion and Larego).



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Huntly Location Plan

0 2.5 5 10 15 20 Kilometers

1 cm = 3 kilometers [Page Size: A3]

LEGEND

- Operational Area Locations
- Alcoa Mine Lease Boundary

Environmentally Hazardous Materials Management Plan
Huntly & Willowdale Mine Sites

EHS Support

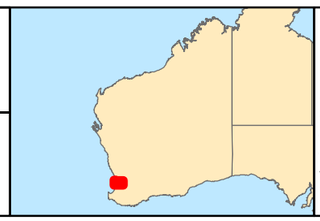

Figure 2-1

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CREATED BY:	D. Barnes
APPROVED BY:	R. Anderson
PROJECT REF. NO:	PTY.05420
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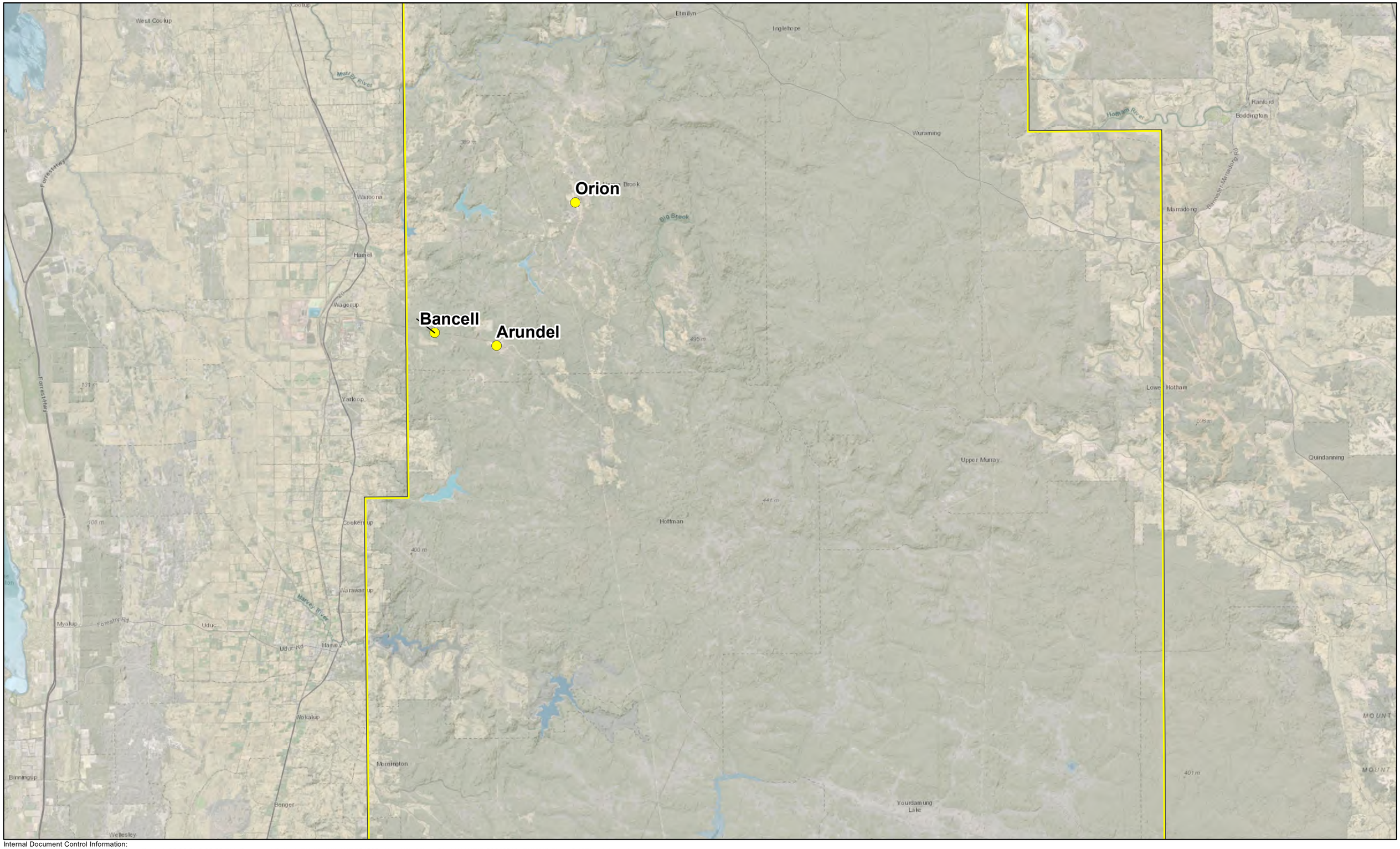
SCALE:	1:250,000
AERIAL IMAGE SOURCE:	ESRI Basemap



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Willowdale Location Plan

0 2.5 5 10 15 20 Kilometers

1 cm = 2 kilometers [Page Size: A3]

LEGEND

- Operational Area Locations
- Alcoa Mine Lease Boundary

Environmentally Hazardous Materials Management Plan Huntly & Willowdale Mine Sites

EHS Support

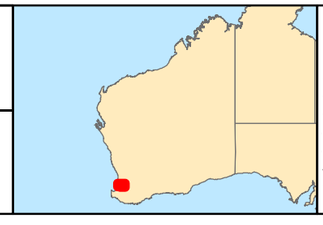

Figure 2-2

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APPROVED BY:	R. Anderson
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MAP PROJECTION:	Transverse Mercator
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SCALE:	1:200,000
AERIAL IMAGE SOURCE:	ESRI Basemap

2.2 Key Environmental Factors

The key environmental factors addressed in this EHMMP are described in **Table 2-1**.

Table 2-1: Key Environmental Values, Potential Impacts, and Potential Pathways as Addressed in this EHMMP

Key Environmental Factor	Environmental Objective	Environmental Value	Pathways	Potential Impacts (direct/indirect)
Inland Waters	*"To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected."*	**Public Drinking Water Areas** • Public Drinking Water Source Areas (PDWSA) • Non-PDWSA Areas • Streams • Reservoirs **Surface water** • Tributaries leading into reservoirs. **Groundwater** **Ecological receptors** • Stream derived vegetation and aquatic fauna that have direct interaction with groundwater and surface water	• Flow into streams discharged into reservoirs. • Flow directly into reservoirs. • Groundwater contamination.	Contamination (hydrocarbons, ethylene glycols, PFAS, metals, salinity, fertilisers (nutrients), herbicides) as a result of: • Native Vegetation Clearing • Pit development including explosives use and personnel access • Loss of Containment events • Drainage event • Haul roads and causeways • Vehicle movements and associated hydrocarbon spills • Mine facilities (Workshops, etc) and associated hazardous material storage and use • Wastewater and sewage management • Surface water abstraction • Groundwater interactions with surface water • Rehabilitation management including fertiliser and herbicide application
Human Health	*"To protect human health from significant harm."*	**Public Drinking Water Areas** • Public Drinking Water Source Areas (PDWSA) • Non-PDWSA Areas • Streams • Reservoirs **Surface water** • Tributaries leading into reservoirs **Groundwater**	• Flow into streams discharged into reservoirs. • Flow directly into reservoirs. • Groundwater contamination.	Contamination (hydrocarbons, ethylene glycols, PFAS, metals, salinity, fertilisers (nutrients), herbicides) as a result of: • Native Vegetation Clearing • Pit development including explosives use and personnel access • Loss of Containment events • Drainage event • Haul roads and causeways • Vehicle movements and associated hydrocarbon spills • Mine facilities (Workshops, etc) and associated hazardous material storage and use • Wastewater and sewage management • Surface water abstraction • Groundwater interactions with surface water • Rehabilitation management including fertiliser and herbicide application

Key Environmental Factor	Environmental Objective	Environmental Value	Pathways	Potential Impacts (direct/indirect)
Flora & Vegetation	*"To protect flora and vegetation so that biological diversity and ecological integrity are maintained."*	**Surrounding Forest** **Ecological receptors** • Stream derived vegetation that have direct interaction with groundwater and surface water	• Flow to soil • Flow directly to flora and vegetation	Contamination (hydrocarbons, ethylene glycols, PFAS, metals, salinity, fertilisers (nutrients), herbicides) as a result of: • Native Vegetation Clearing • Pit development including explosives use and personnel access • Loss of Containment events • Drainage event • Haul roads and causeways • Vehicle movements and associated hydrocarbon spills • Mine facilities (Workshops, etc) and associated hazardous material storage and use • Wastewater and sewage management • Surface water abstraction • Groundwater interactions with surface water • Rehabilitation management including fertiliser and herbicide application
Terrestrial Fauna	*"To protect terrestrial fauna so that biological diversity and ecological integrity are maintained."*	**Surrounding Forest**	• Flow to soil • Flow directly to terrestrial fauna	Contamination (hydrocarbons, ethylene glycols, PFAS, metals, salinity, fertilisers (nutrients), herbicides) as a result of: • Native Vegetation Clearing • Pit development including explosives use and personnel access • Loss of Containment events • Drainage event • Haul roads and causeways • Vehicle movements and associated hydrocarbon spills • Mine facilities (Workshops, etc) and associated hazardous material storage and use • Wastewater and sewage management • Surface water abstraction • Groundwater interactions with surface water • Rehabilitation management including fertiliser and herbicide application
Terrestrial Environmental Quality	*"To maintain the equality of land and soils so that environmental values are protected."*	**Surrounding Forest**	• Flow to soil	Contamination (hydrocarbons, ethylene glycols, PFAS, metals, salinity, fertilisers (nutrients), herbicides) as a result of: • Native Vegetation Clearing • Pit development including explosives use and personnel access • Loss of Containment events • Drainage event • Haul roads and causeways • Vehicle movements and associated hydrocarbon spills • Mine facilities (Workshops, etc) and associated hazardous material storage and use • Wastewater and sewage management • Surface water abstraction • Groundwater interactions with surface water • Rehabilitation management including fertiliser and herbicide application

2.3 Condition Requirements

This EHMMP has been prepared in accordance with the requirements of 2023 – 2027 MMP Ministerial Approval Condition 15(b). The requirements of Ministerial Approval Condition 15(b) and where they are addressed in this EHMMP are provided in **Table 2-2**.

Table 2-2: Requirements for this EHMMP

Ministerial Approval Conditions	Section
4(b). avoiding or otherwise minimising discharge of environmentally hazardous material outside of containment infrastructure.	**Section 2 & 3**
15(b). Alcoa must prepare an Environmentally Hazardous Materials Management Plan that satisfies the requirements of conditions 18 and 19 and demonstrates how the environmental objective:	This EHMMP
(i) satisfies the requirements of conditions 18 and 19; and	The sections listed below:
(ii) demonstrates how the environmental objective in condition 4(b) will be achieved.	**Sections 2 & 3**
18. Demonstrate compliance with relevant *'Operational restrictions'* and *'Clearing restrictions'* conditions and must also include:	The sections listed below:
a) threshold criteria and trigger criteria that are relevant to the environmental impacts that the plan is mitigating and managing;	**Section 3**
b) monitoring parameters, sites, control/reference sites, methodology, timing, and frequencies, which will be used to measure threshold criteria;	**Section 3**
c) methodology for determining alternate monitoring sites as a contingency if proposed sites are not suitable in the future;	N/A
d) Data collection and analysis methodologies;	**Section 3**
e) adaptive management methodology;	**Section 4**
f) contingency measures which will be implemented if threshold criteria or trigger criteria are not met; and	**Section 3**
g) reporting requirements.	**Section 3**
19. The management plans must also contain provisions which demonstrate whether conditions 4 (a) and (b) and relevant *'Operational restrictions"* and *'Clearing restrictions'* conditions are reasonably likely to be met, and must also include:	The sections listed above and below:
a) management actions;	**Section 3**
b) management targets;	**Section 3**
c) contingency measures if management targets are not met; and	**Section 3**
d) reporting requirements.	**Section 3**

2.4 Rationale and Approach

This EHMMP provides a combination of objective-based and outcome-based provisions for potential impacts associated with environmental values specific to Alcoa's activities (Exploration, Clearing, Development and Mining). Objective-based provisions have been applied where a level of uncertainty exists that prevents setting achievable and effective objectives with measurable trigger and threshold criteria. Therefore, management targets have been developed to measure the success of management actions in achieving the environmental outcome.

Outcome-based provisions have been applied where a sufficient level of information exists to establish objectives and measurable criteria (EPA, 2021a).

Outcomes and objectives within this EHMMP are directly related to potential impacts associated with Ministerial Condition 4(b), *avoiding or otherwise minimising discharge of environmentally hazardous material outside of containment infrastructure.*

Outcomes will be managed by establishing the following criterion, parameters, methodology and requirements set forth in Ministerial Condition 18:

a) *threshold criteria and trigger criteria that are relevant to the environmental impacts that the plans are mitigating and managing;*
b) *monitoring parameters, sites, control/reference sites, methodology, timing and frequencies, which will be used to measure threshold criteria and trigger criteria;*
c) *methodology for determining alternate monitoring sites as a contingency if proposed sites are not suitable in the future;*
d) *data collection and analysis methodologies;*
e) *adaptive management methodology;*
f) *contingency measures which will be implemented if threshold criteria or trigger criteria are not met; and*
g) *reporting requirements.*

Objectives will be managed by establishing the following actions, targets, measures and requirements set forth in Ministerial Condition 19:

a) *management actions;*
b) *management targets;*
c) *contingency measures if management targets are not met; and*
d) *reporting requirements.*

2.4.1 Survey and Study Findings

Alcoa has completed Detailed Site Investigations (DSIs) to determine the impact of Per- and polyfluoroalkyl substances (PFAS), hydrocarbons, ethylene glycols, and other environmentally hazardous materials on human health and the environment at the HUN and WDL. Alcoa has also developed a PFAS Management Strategy to guide sites when undertaking activities requiring PFAS assessment. The DSIs and PFAS Management Strategy were considered during the development of this EHMMP.

2.4.2 Key Assumptions and Uncertainties

This EHMMP does not include detailed instruction on day-to-day site-specific management of environmentally hazardous materials; rather, the EHMMP is a guide to the Alcoa internal documents and the objectives and targets for the management of environmentally hazardous materials. Management processes and actions are subject to revision as new information becomes available.

2.4.3 Objective-Based EMP – Risk-Based Approach

Alcoa has performed a risk assessment to identify and mitigate the environmental, health, and safety risks posed by the loss of containment of environmentally hazardous materials during transportation, storage, and from mining activities at the HUN and WDL mine sites. The Risk Assessment details the process controls, operational and emergency procedures, and emergency equipment and training for each risk identified. The following risk events were reviewed during the risk assessment:

- Loss of containment from mining support services within operational areas;
- Transport of septic waste;
- Treatment of septic waste using Biomax treatment systems;
- Irrigation of fields using treated septic waste;
- Service trucks supplying fuel, oil and lubricants; and
- Controlled waste transport of oily water and hydrocarbon sludge.

Methods of prevention, detection, protection, process controls, emergency procedures and mitigation are detailed within this EHMMP.

2.4.4 Rationale for Choice of Management Actions

The management actions and management targets identified within this EHMMP have been developed based on the Environmental Protection Authority (EPA) mitigation hierarchy (avoid, minimise, rehabilitate, offset). Objective-based targets will avoid and minimise loss of containment of environmentally hazardous materials (**Table 3-1**), while outcome-based provisions will minimise impacts (**Table 3-2**).

3 EHMMP Components

3.1 Objective-based Targets

Objective-based targets are described in **Table 3-1**.

Table 3-1: Objective-based Targets

EPA factors and objectives: Refer to **Table 2-1** **Objectives:** Minimise impact to public drinking water supply & Minimise impact to biological diversity. **Key environmental values:** Groundwater, surface water, Public Drinking Water Source Areas, Non-Public Drinking Water Source Areas, streams, reservoirs, flora, vegetation, terrestrial fauna, soils, land. **Key impacts and risks:** Contamination of groundwater, surface water, public drinking water, flora, vegetation, soils, land, terrestrial fauna.					
Objective-based					
#	**Management targets**	**Management actions**	**Monitoring**	**Timing / frequency of monitoring / actions**	**Reporting**
1	Minimise impact to public health and ecological factors from transport of environmentally hazardous materials (septic waste, hydrocarbons, controlled waste, explosives)	• Review and approve all environmentally hazardous materials through Paratox software system prior to delivery, storage, and use on-site. • Limit of 15,000L of any chemical to be transported across Big Brook Causeway and Samson Dam Causeway. • Maximum of 8,000L of chemicals to be transported across Dellamadellena stream crossing in the Serpentine Pipehead Dam Catchment at Huntly at any one time. • Update emergency response procedures to include new DG and hazardous materials as needed. • Spill response equipment and/or trailers available to use to respond in case of loss of containment (LOC). • Follow internal procedures and guidelines regarding LOC, cleanup, and reporting: • Prevent further LOC immediately. • Contain the LOC immediately. • Report to Supervisor immediately. • Supervisor inspects LOC immediately. • Supervisor arranges remediation and verifies remediation. • All new employees and contractors must undergo an induction to provide awareness of the safety and environmental issues at HUN and WDL, including hazardous materials management and spill response training. • Review and approve internal waste transport and disposal permit for the transport and disposal of controlled waste. • Update waste disposal permit register. • Obtain a signed Controlled Waste Tracking Form (CWTF) from the waste holder for all controlled waste equal to or greater than 200 kg or 200 L in accordance with the Consolidated Waste Guidelines. • Manage transport of explosives in accordance with the *Dangerous Goods Safety (Explosives) Regulation, 2007*. • In accordance with *Dangerous Goods Safety (Explosives) Regulations, 2007,* a risk assessment of the security and safety management of explosives storage, handling, transport & use onsite will be conducted. • New employees and contractors are trained prior to beginning work onsite. • Employees are given job-specific training.	• Register maintained for chemical usage and recorded in Paratox software • Training records indicate all Alcoa workforce and contractors understand the basic requirements of spill prevention, control, and countermeasures. • Training records are maintained within Alcoa's Learning Management System (LMS). • Review of Dangerous Goods Manifest and Dangerous Goods License prior to renewal. • Remediation laboratory sample sent to a Nata Accredited laboratory for analysis where required. • Compare sample results against standards and guidelines defined within the Water Resources Management Plan. • Completion of Alcoa Self-Assessment Audits. • Keep record of CWTF for a minimum of 6 years. • Waste disposal permit register updated as required for each new waste movement as per the Waste Transport and Disposal Permit procedure. • Review of Magazine Access Record listing authorised personnel for access to explosives. • Remediation validation laboratory sample sent to a Nata Accredited laboratory for analysis where required. • Compare sample results against standards and guidelines defined within the Water Resources Management Plan.	• Annual review and audit of training records. • Alcoa Self-Assessment Tool (ASAT) audits are undertaken as per the ASAT schedule. • The Dangerous Goods Improvement Plan has been developed by Alcoa and is aimed to be reviewed annually to update and track progress on improvements that have come from the risk assessment to ensure adequate controls are in place for spill containment, segregation, protection from impact, transferring DGs, ignition sources and pipework. • Magazine Access Record reviewed biannually by Quarry Manager. • Renewal of Explosives Licence every 5 years. • A review annually (or when legislation changes or reportable incident occurs) of *Dangerous Goods Safety (Explosives) Regulations, 2007,* risk assessment for the security and safety management of explosives storage, handling, transport & use onsite.	See Table 3-3, Reporting Requirements
2	Minimise impact to public health and ecological factors from storage of environmentally hazardous materials (septic waste, hydrocarbons, controlled waste, explosives)	• Alcoa will submit the Water Corporation document: "Alcoa Submission form for the Approval of Chemical Use in a Drinking Water Catchment" and receive approval to use materials that are applied to ground or at high risk of having residual amounts within the catchment. • Review and approve all environmentally hazardous materials through Paratox software system prior to delivery, storage, and use on-site. • No fuel storage within PDWSA & RPZ. • Obtain approval of chemical storage within PDWSAs, avoid where possible.	• Training records indicate all Alcoa workforce and contractors understand the basic requirements of spill prevention, control, and countermeasures. • Training records are maintained within Alcoa's LMS.	• All environmentally hazardous materials reviewed prior to onsite storage and use. • Renewal of Dangerous Goods Licence every 5 years. • A review period of every 5-years (or when a major change to DG stores occurs) for *Dangerous Goods Safety*	See Table 3-3, Reporting Requirements

EPA factors and objectives: Refer to **Table 2-1** **Objectives:** Minimise impact to public drinking water supply & Minimise impact to biological diversity. **Key environmental values:** Groundwater, surface water, Public Drinking Water Source Areas, Non-Public Drinking Water Source Areas, streams, reservoirs, flora, vegetation, terrestrial fauna, soils, land. **Key impacts and risks:** Contamination of groundwater, surface water, public drinking water, flora, vegetation, soils, land, terrestrial fauna.					
Objective-based					
#	**Management targets**	**Management actions**	**Monitoring**	**Timing / frequency of monitoring / actions**	**Reporting**
		• Identify sumps requiring clean-out for the annual sump clean-out program conducted in summer to ensure capacity within the sumps in winter. • All tanks and containment are to be managed in accordance with Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations (WA). • Implement adequate maintenance schedules with inspection and maintenance procedures such as: o structural tank inspections; and o concrete inspections. • Update emergency response procedures to include new DG and hazardous materials as needed. • Spill response equipment and/or trailers available to use to respond in case of loss of containment (LOC). • Follow internal procedures and guidelines regarding LOC, cleanup, and reporting: • Prevent further LOC immediately. • Contain the LOC immediately. • Report to Supervisor immediately. • Supervisor inspects LOC immediately. • Supervisor arranges remediation and verifies remediation. • All new employees and contractors must undergo an induction to provide awareness of the safety and environmental issues at HUN and WDL, including hazardous materials management and spill response training. • Review and approve internal waste transport and disposal permit for the transport and disposal of controlled waste. • Update waste disposal permit register. • In accordance with the *Dangerous Goods Safety (storage and Handling of Non-explosives) Regulations 2007*, a risk assessment for all storage above placarding quantities will be conducted. • Obtain a signed Controlled Waste Tracking Form (CWTF) from the waste holder for all controlled waste equal to or greater than 200 kg or 200 L in accordance with the Consolidated Waste Guidelines. • Manage storage of explosives in accordance with the *Dangerous Goods Safety (Explosives) Regulations, 2007.* • In accordance with *Dangerous Goods Safety (Explosives) Regulations, 2007,* a risk assessment of the security and safety management of explosives storage, handling, transport & use onsite will be conducted. • New employees and contractors are trained prior to beginning work onsite. • Employees are given job-specific training.	• Review of Dangerous Goods Manifest and Dangerous Goods Licence prior to renewal. • Remediation validation laboratory sample sent to a Nata Accredited laboratory for analysis where required. • Compare sample results against standards and guidelines defined within the Water Resources Management Plan. • Visual observation of sumps. • Inspect tanks/containers in accordance with *The Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007, s.61*. • Complete integrity testing of tanks/containers in accordance with Storage and Handling of Dangerous Goods Code of Practice • Review of Magazine Access Record listing authorised personnel for access to explosives. • Explosives Storage Licences reviewed prior to renewal.	*(storage and Handling of Non-explosives) Regulations, 2007* risk assessment. • Frequency of container inspections to be in accordance with legislation referenced in **Appendix A**. • Keep record of CWTF for a minimum of 6 years. • Waste disposal permit register updated as required for each new waste movement as per the Waste Transport and Disposal Permit procedure. • Magazine Access Record reviewed biannually by Quarry Manager. • Renewal of Explosives Licence every 5 years. • A review annually (or when legislation changes or reportable incident occurs) of *Dangerous Goods Safety (Explosives) Regulations, 2007,* risk assessment for the security and safety management of explosives storage, handling, transport & use onsite. • Annual review and audit of training records.	
3	Minimise impact to public health and ecological factors from environmentally hazardous materials used within operational areas	• Review and approve all environmentally hazardous materials through Paratox software system prior to delivery, storage, and use on-site. • Avoid use of materials containing PFAS. • No workshops or septic infrastructure within RPZ. • All refuelling activities to occur outside PDWSA and RPZ. • No servicing of machinery to occur within PDWSA & RPZ. • Apply adequate buffer of 20 m between application area and water i.e. streams, reservoirs and bores for any pesticide application (approval to go within 20 m buffer is sought through DWER/DoH). • Follow Guidelines for pesticide application in drinking water catchments using PC88. Any pesticides that are not listed in PC88 must not be used without permission from Water Corporation (liaison with DER/DoH). • Obtain Permit from Source Water Protection, Water Corporation prior to commencing work within PDWSA. • Operation of the dissolved Air Floatation (DAF) Treatment Plant (located at McCoy & Larego) to treat hydrocarbon contaminated water from workshops, wash down bays, fuel bays & silt storage beds.	• Register maintained for chemical usage and recorded in Paratox software. • Training records indicate all Alcoa workforce and contractors understand the basic requirements of spill prevention, control, and countermeasures. • Training records are maintained within Alcoa's Learning Management System (LMS). • Review of Dangerous Goods Manifest and Dangerous Goods License prior to renewal. • Visual observation of sumps. • Remediation laboratory sample sent to a Nata Accredited laboratory for analysis where required.	• All environmentally hazardous materials reviewed prior to onsite storage and use. • Daily maintenance check on wastewater treatment plants, monthly services and required repairs. • Refer to the *Environmental Protection Act 1986* Licence (WDL) for timing & frequency for monitoring at water treatment plants (**Appendix C**). • Refer to the *Environmental Protection Act 1986* Licence (HUN) for timing & frequency for monitoring at water treatment plants (**Appendix C**). • A review annually (or when legislation changes or reportable incident occurs) of *Dangerous Goods Safety*	See Table 3-3, Reporting Requirements

EPA factors and objectives: Refer to **Table 2-1** **Objectives:** Minimise impact to public drinking water supply & Minimise impact to biological diversity. **Key environmental values:** Groundwater, surface water, Public Drinking Water Source Areas, Non-Public Drinking Water Source Areas, streams, reservoirs, flora, vegetation, terrestrial fauna, soils, land. **Key impacts and risks:** Contamination of groundwater, surface water, public drinking water, flora, vegetation, soils, land, terrestrial fauna.					
Objective-based					
#	**Management targets**	**Management actions**	**Monitoring**	**Timing / frequency of monitoring / actions**	**Reporting**
		• Operation of oil skimmer and anpress at Arundel to treat oily water from the Arundel Workshop. • Operation of ultraspin treatment unit at Myara to treat hydrocarbon contaminated water from workshops, wash down bays, fuel bays & silt storage beds. • Operation of oil skimmer and separator wastewater treatment unit to remove free oil and grease from wastewater from the Orion workshop. • Maintenance of the water treatment plants. • Update emergency response procedures to include new DG and hazardous materials as needed. • Spill response equipment and/or trailers available to use to respond in case of loss of containment (LOC). • Follow internal procedures and guidelines regarding LOC, cleanup, and reporting: • Prevent further LOC immediately. • Contain the LOC immediately. • Report to Supervisor immediately. • Supervisor inspects LOC immediately. • Supervisor arranges remediation and verifies remediation. • All new employees and contractors must undergo an induction to provide awareness of the safety and environmental issues at HUN and WDL, including hazardous materials management and spill response training. • In accordance with *Dangerous Goods Safety (Explosives) Regulations, 2007,* a risk assessment of the security and safety management of explosives storage, handling, transport & use onsite will be conducted. • New employees and contractors are trained prior to beginning work onsite. • Employees are given job-specific training.	• Compare sample results against standards and guidelines defined within the Water Resources Management Plan. • Refer to the *Environmental Protection Act 1986* Licence (WDL) for monitoring locations (**Appendix C**). Refer to the *Environmental Protection Act 1986* Licence (HUN) for monitoring locations (**Appendix C**).	*(Explosives) Regulations, 2007,* risk assessment for the security and safety management of explosives storage, handling, transport & use onsite. • Annual review and audit of training records.	

3.2 Outcome-based Provisions

Outcome-based provisions are described in **Table 3-2**.

Table 3-2: Outcome-based Provisions

EPA Factors and Objectives: Inland Waters. *"To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected."* Public Health. **Outcome:** Avoiding or otherwise minimising discharge of environmentally hazardous material outside of containment infrastructure. **Key environmental values:** Surface water, groundwater, streams, reservoirs, stream derived vegetation, aquatic fauna, public drinking water & non-public drinking water. **Key impacts and risks**: Contamination of groundwater, surface water and public drinking water.				
Outcome-based				
Criteria: • Trigger criteria • Threshold criteria	**Response Actions:** • Trigger level actions • Threshold contingency actions	**Monitoring**	**Timing/ frequency of monitoring**	**Reporting**
Trigger criterion 1 Exceedance above Australian and New Zealand Guidelines for Fresh and Marine Water Quality guidelines for hydrocarbons. **Threshold criterion 1** Exceedance of trigger limit: • Total Petroleum Hydrocarbons – 7 (ug/L)	**Trigger level actions:** • Follow internal procedures and guidelines regarding loss of containment (LOC), cleanup, and reporting: ○ Prevent further LOC immediately. ○ Contain the LOC immediately. ○ Report to Supervisor immediately. ○ Cleanup/remediate spill. • Sample at high-risk containment structure[1]. • Investigation	**Indicator** • High-risk containment structure[1]. Laboratory sample sent to a Nata Accredited laboratory for analysis to confirm presence of environmentally hazardous material within high-risk containment structure. Remediation sample validation conducted by using RemScan method. Compare sample results against standards and guidelines defined	Frequency determined at monitoring locations based on operational activities and associated risk. Sample if an overflow from high-risk containment structure[1] occurs. Remediation validation sample taken post LOC event.	• See Table 3-3, Reporting Requirements

[1] Characteristics of a high-risk containment structure/sump:
- Spill or overflow from the containment structure has the potential to extend beyond the approved footprint, AND
- Laboratory analysis has confirmed the presence of environmentally hazardous materials within the containment structure, OR
- Containment structure located within a catchment where there has been a spill (or where there is likely to be a presence) of environmentally hazardous material within the last 12 months, OR
- The containment structure has not been subject to any laboratory analysis to confirm (or otherwise) the presence of environmentally hazardous material.

EPA Factors and Objectives: Inland Waters. *"To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected."* Public Health. **Outcome:** Avoiding or otherwise minimising discharge of environmentally hazardous material outside of containment infrastructure. **Key environmental values:** Surface water, groundwater, streams, reservoirs, stream derived vegetation, aquatic fauna, public drinking water & non-public drinking water. **Key impacts and risks**: Contamination of groundwater, surface water and public drinking water.				
Outcome-based				
Criteria: • Trigger criteria • Threshold criteria	**Response Actions:** • Trigger level actions • Threshold contingency actions	**Monitoring**	**Timing/ frequency of monitoring**	**Reporting**
	○ Review of monitoring to determine if exceedance was associated with Alcoa activities ○ Report within Incident Management System **Threshold contingency actions:** As per above	within the Water Resources Management Plan. Monitoring locations are subject to change based on operational activities and associated risk.		
Trigger criterion 2 • Exceedance above the Australian and New Zealand Guidelines for Fresh and Marine Water Quality guidelines for Ethylene Glycol. **Threshold criterion 2** Exceedance trigger limit: • Ethylene Glycol – 330 (ug/L)	**Trigger level actions:** • Follow internal procedures and guidelines regarding loss of containment (LOC), cleanup, and reporting: ○ Prevent further LOC immediately. ○ Contain the LOC immediately. ○ Report to Supervisor immediately. ○ Cleanup/remediate spill. • Sample at high-risk containment structure[1]. • Investigation ○ Review of monitoring to determine if exceedance was associated with Alcoa activities	High-risk containment structure[1] . Laboratory sample sent to a Nata Accredited laboratory for analysis to confirm presence of environmentally hazardous material. Laboratory sample sent to a Nata Accredited laboratory for analysis to confirm remediation post-clean-up of LOC event. Compare sample results against standards and guidelines defined within the Water Resources Management Plan. Monitoring locations are subject to change based on operational activities and associated risk.	• Frequency determined at monitoring locations based on operational activities and associated risk. Sample if an overflow from high-risk containment structure[1] occurs. Remediation validation sample taken post LOC event.	• See Table 3-3, Reporting Requirements

EPA Factors and Objectives: Inland Waters. *"To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected."* Public Health. **Outcome:** Avoiding or otherwise minimising discharge of environmentally hazardous material outside of containment infrastructure. **Key environmental values:** Surface water, groundwater, streams, reservoirs, stream derived vegetation, aquatic fauna, public drinking water & non-public drinking water. **Key impacts and risks**: Contamination of groundwater, surface water and public drinking water.				
Outcome-based				
Criteria: • Trigger criteria • Threshold criteria	**Response Actions:** • Trigger level actions • Threshold contingency actions	**Monitoring**	**Timing/ frequency of monitoring**	**Reporting**
	○ Report within Incident Management System **Threshold contingency actions:** As per above			
Trigger criterion 3 • Exceedance at Biomax locations above parameters within Guidelines for Sewerage Systems – Acceptance of Trade Waste (Industrial Waste) (ANZECC) (Nov 1994) & Code of Practice for the Design, Manufacture, Installation and Operation of Aerobic Treatment Units (ATU's) 2015. **Threshold criterion 3** Exceedance of trigger limits: • Biological Oxygen Demand (BODs) <20 mg/L • Thermotolerant coliforms <10 cfu/100ml • pH – 6.5-8.5 • Total Kjeldahl Nitrogen (TK-N) <150 mg/L • Total Phosphorus (P) <50 mg/L	**Trigger level actions:** • Follow internal procedures and guidelines regarding loss of containment (LOC), cleanup, and reporting: ○ Prevent further LOC immediately. ○ Contain the LOC immediately. ○ Report to Supervisor immediately. ○ Cleanup/remediate spill. • Resample at Biomax location to confirm exceedance • Investigation • Report within Incident Management System **Threshold contingency actions:** As per above	**Indicator** • Willowdale Biomax locations: Larego Administration, Arundel, Orion, Larego HV/LV Refuelling & Larego Crusher. • Huntly Biomax locations: Pinjarra stacker, Del Park, Huntly Administration, White Road, McCoy Main Workshop, McCoy Hull, Myara Contractors yard, Myara Crusher, Myara Hot Seat Parkup & Myara Offices • Laboratory sample from Biomax unit outflow sent to a NATA Accredited laboratory for analysis.	• Sampling done quarterly.	• See Table 3-3, Reporting Requirements

3.3 Reporting Requirements

The reporting requirements relating to the implementation of the EHMMP are detailed in **Table 3-3**.

Table 3-3: Reporting Actions

Notification Event	Requirement	Action	Responsibility	Timing
Pesticide (including herbicides) usage Report	Water Working Arrangements (between Alcoa World Alumina, Department of Water and Environmental Regulation and Water Corporation covering Alcoa's mining operations in Western Australia)	1. Alcoa to provide letter to Water Corporation and the Department of Health (DoH) indicating the quantity of pesticides (including herbicides) used at Alcoa mining operations.	Environmental Manager	Annually
Dangerous Goods Incident	Section 9 of the *Dangerous Goods Safety Act 2004*	1. Reporting to Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) of reportable dangerous goods incident	Environmental Manager	As soon as practicable
		2. Submit a dangerous goods report to DEMIRS or reportable dangerous goods incident.		Within 21 days
Drainage Incident	Environmental Protection (Darling Range Bauxite Mining Proposals) Exemption Order 2023 Schedule 1, Division 2, clause 6 of conditions to which exemption from s. 41A is subject	1. Report the incident to the Department of Water and Environmental Regulation (DWER) CEO	Environmental Manager	Within 24 hours
		2. Investigate: a) The cause of the incident; and b) The environmental impacts of the incident; and 3. Advise the DWER CEO of: a) The outcome of investigations made under paragraph (b); b) The measures that have been, are being or will be implemented to rectify the incident; and c) Other measures that have been, are being, or will be implemented to avoid or minimise the environmental impact of the incident.		Within 21 days
	Alcoa Reporting Guidelines	1. Report to supervisor in the event of a release to the environment	Personnel first to identify incident	As soon as practicable
		2. Enter into Alcoa incident reporting software	Personnel first to identify incident	Within 3 days
		1. Report this to the DWER, the Water Corporation, and the State Development Minister within 24 hours;	Environmental Manager	Within 24 hours

Notification Event	Requirement	Action	Responsibility	Timing
Failure of drainage or discharge from containment structure that includes any potentially environmentally hazardous material	Ministerial Approval Condition 29	2. Implement contingency measures;		
		3. Investigate the cause; 4. Investigate environmental impacts; 5. Advise rectification measures to be implemented; 6. Advise any other measures to be implemented to ensure no further impact; and 7. Provide a report to the State Development Minister of being aware of the potential non-compliance, detailing the measures required in conditions 29(a)-(g)		Within 21 days
	Alcoa Reporting Guidelines	1. Report to supervisor in the event of a release to the environment	Personnel first to identify incident	As soon as practicable
		2. Enter into Alcoa incident reporting software	Personnel first to identify incident	Within 3 days
Annual Compliance Assessment	Ministerial Approval Condition 32	Prepare an Annual Compliance Assessment for the purpose of determining whether the conditions in the MMP approval are being complied with. The Annual Compliance Assessment will be made publicly available on Alcoa's website (www.alcoa.com) in accordance with Ministerial Approval Condition 38. The Annual Compliance Assessment will include the following elements: 1. Details of the independent qualified person engaged to undertake monitoring under condition 28; 2. What, when, and how information will be collected and recorded to assess compliance; 3. The methods which will be used to assess compliance; 4. The methods which will be used to validate the adequacy of the compliance assessment to determine whether the conditions outlined in this condition set are being complied with; 5. The retention of previous compliance assessments; 6. The table of contents of Compliance Assessment Reports, including audit tables; and 7. How and when Compliance Assessment Reports will be made publicly available.	Environmental Manager	Annually

4 Adaptive Management and Review

4.1 Adaptive Management

The EHMMP applies the standards of adaptive management through monitoring, corrective actions, and implementing changes. The EHMMP is intended to be dynamic and will be revised to reflect changes in management practices and changes in the environment with time. This will also allow flexibility to respond to new environmental impacts and adopt new technologies and management actions.

In line with the concept of adaptive management and considering the above, the management actions presented in this EHMMP shall be monitored, evaluated, and updated as required, considering:

- Monitoring identifies a non-conformance with the EHMMP;
- Outcomes of incident investigations or audits;
- Outcomes of any technical review of and evaluation of monitoring programs;
- New and relevant data/information gained as a result of implementing this EHMMP, or from external sources;
- Significant changes to industry standard management practices; and
- Changes in State or Commonwealth legislation or policy.

Relevant updates will be included in a revised EHMMP.

4.2 Review of this EHMMP

In accordance with Condition 21 of the Ministerial Approval, Alcoa:

a) May review, revise, and re-submit to the State Development Minister this EHMMP at any time provided it meets the relevant requirements of the EHMMP, including any consultation that may be required when preparing the management plan; and
b) Must review and revise this EHMMP and ensure it meets the relevant requirements of the EHMMP, including any consultation that may be required when preparing the management plan, as and when directed by the State Development Minister.

Technical review and evaluation of the management actions outlined in this EHMMP will be conducted to ensure the management actions are adequately addressing the key risks and meeting Ministerial approval conditions and objectives. If, as a result of any review, any significant changes are required to be made to this EHMMP, a revised EHMMP will be provided to the EPA for approval (if required). If significant change to either the facility, activity, or risk is identified, a revised EHMMP will be submitted to the EPA.

5 Stakeholder Consultation

Although this EHMMP does not require Stakeholder Consultation under the Ministerial Conditions for the 2023-2027 MMP, informal advice from representatives from the Mining and Management Program Liaison Group (MMPLG) was provided. The advice provided by MMPLG included identifying environmentally hazardous materials to consider within the EHMMP.

6 References

Alcoa of Australia Limited (2023) *Final mining and management program (MMP) 2023-2027 inclusive final: Huntly Mine and Willowdale mine,* Alcoa of Australia Limited.

Alcoa of Australia Limited (2023) *Water resources management plan Huntly and Willowdale mine*, Alcoa of Australia Limited.

Environmental Protection authority (EPA) (2021a). *Interim Guidance – Environmental outcomes and outcomes-based conditions,* EPA Western Australia.
Interim_Guidance_Environmental_outcomes_and_outcomes_based_conditions.pdf (epa.wa.gov.au)

Environmental Protection Authority (EPA) (2021b). *Templates – Environmental Management Plans*. Template - Environmental Management Plans.docx (live.com)

Environmental Protection Authority (EPA) (2023). *Statement of environmental principles, factors, objectives and aims of EIA*, EPA, Western Australia. Statement of environmental principles, factors, objectives and aims of EIA (epa.wa.gov.au)

Environmental Protection Authority (EPA) (2024). *Instructions: How to prepare Environmental Protection Act 1986 Part IV environmental management plans*. EPA, Western Australia. Instructions: How to prepare EP Act Part IV environmental management plans

Environmental Protection (Darling Range Bauxite Mining Proposals) Exemption Order 2023.

7 APPENDICES

Appendix A: Summary of Legislation, Australian Standards, and other Guidelines Relevant to this EHMMP

LEGISLATION

Legislation	Details
Explosives and Dangerous Goods Act, 1961 (WA)	Explosives are regulated by the *Explosives and Dangerous Act, 1961* and the *Dangerous Goods* (*Explosives) Regulation, 2007.* Importation, manufacture, sale and use and the classification, marking, storage, carriage, of explosives are set out in Part III of the Explosives and Dangerous Goods Act, 1961. Regulation and licencing of dangerous goods are covered in Part IV Explosives and Dangerous Goods Act, 1961.
Dangerous Goods Safety (Explosives) Regulations, 2007 (WA)	The *Dangerous Goods Safety (Explosives) Regulation, 2007* is made under the *Explosives and Dangerous Goods Act, 1961* and deals with the following: a) Matters relating to Security Clearances required to handle explosives and explosive precursors (Part 3); b) Authorisation of explosives (Part 4); c) General provisions about explosives (Part 5); d) Possession of explosives (Part 6); e) Import and export of explosives (Part 7); f) Manufacture of explosives (Part 8); g) Storage of explosives (Part 9); h) Transport of explosives by road or rail and in mines (Part 10); i) Supply of explosives (Part 11); j) Disposal of explosives (Part 14); and k) Matters relating to licences under the *Explosives and Dangerous Goods Act, 1961* (Part 15).
Dangerous Goods (Storage and Handling of Non-Explosives) Regulations, 2007 (WA)	The *Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulation, 2007 deals with the following:* a) Duties and licensing of dangerous goods sites (Part 2); b) Risk and safety management (Part 3); c) Design and operation of storage and handling facilities (Part 4); d) Transit storage and transfer (Part 5); and *e)* Emergency Management (Part 6).
Environmental Protection Act, 1968 (WA) (EP Act)	The EP Act 1986 was proclaimed on February 1987 and replaced the EP Act 1971 and repealed the Clean Air Act 1964-1985, parts of the Noise Abatement Act 1972 and Part III A of the Rights in Water and Irrigation Act 1914-1985. The EP Act
Environmental Protection Amendment Act, 2020 (WA) (EP Amendment Act)	In November 2020 the EP Amendment Act was passed, amending the EP Act 1968 to: Streamline the Part IV environmental impact assessment process; Create cost recovery provisions related to Part IV of the EP Act; Develop greater flexibility, efficiency, and transparency for clearing native vegetation while also ensuring protection of native vegetation with crucial environmental values; Improve efficiency of emissions and discharges regulation; Modernise and improve defence and investigation and enforcement powers as well as provide enhanced modified penalties; Introduce DWER's ability to require a clearing permit holder or a Part IV proponent to give an environmental protection covenant; Initiate environmental monitoring programs which address cumulative environmental impacts from certain industries or in particular areas and recover the costs of monitoring; and Allow bilateral assessment/approval agreements under the EPBC Act (1999) including cost recovery fees.
Work Health and Safety Act, 2020 (WA) (WHS Act)	The Work Health and Safety (WHS) Act covers all workplaces within the natural jurisdiction of Western Australia, including mines, petroleum and geothermal energy operations. Under the WHS Act, all PCBUs are the primary duty holder to ensure the health and safety of their workers and other people who may be affected by the carrying out of work. The categories of persons subject to the operation of the Act include persons conducting a business or undertaking (PCBU), officers, and workers. The WHS Act 2020 also introduces significantly higher maximum penalties for all breaches of health and safety duties and considers it an offence for a person or PCBU to enter into insurance coverage for

Legislation	Details
	any fines imposed under the Act. The WHS Act 2020 also broaden the requirements to notify the regulator as soon as a workplace death, serious injury or illness or dangerous incident arises out of the conduct of the business or undertaking.
Work Health and Safety (Mines) Regulation, 2022 (WA)	The Work Health and Safety (WHS [Mines]) Regulation applies to current and future mining and mineral exploration operations and provides a duty for mine operators to manage hazards and associated risks using risk management principles. In addition, a new requirement of the WHS Mines Regulation is the requirement for a mine operator to prepare, implement and maintain a mine safety management system (MSMS) for the mine/exploration operation. The MSMS is a framework that brings together the mine's policies, systems, procedures and plans to enable a mine operator to ensure the safe operation of a mine.
Work Health and Safety (General) Regulations, 2022 (WA)	The Work Health and Safety (WHS (General) Regulations sets out the requirements for providing a safe and healthy work environment. PCBUs have the primary duty to, as far as reasonably practicable, ensure the health and safety of workers (which includes contractors, subcontractors, and labour hire employees), and others who may be affected by the carrying out of the work. Officers of PCBUs will be subject to a non-delegable standalone duty to exercise due diligence to ensure that their safety obligations are met, along with consultation with workers, and stakeholders, on issues of safety.

AUSTRALIAN STANDARDS

Standards	Details
Australian Standard (AS) 1216-2006: Class labels for dangerous goods	This Standard sets out details of the design and selection of labels appropriate to the classes, categories, and subsidiary risks of dangerous goods designated in the ADG Code.
AS 1319-1994 Safety Signs for the Occupational Environment	Any warnings, conditions of entry, emergency directions, or other information intended for persons entering a restricted area shall be displayed on signs and notices at each point of access. Signs shall be constructed in accordance with AS 1319:1994 Safety Signs for the Occupational Environment.
AS 1345-1995 Identification of the Contents of Pipes and Conduits and Ducts	AS 1345:1995 Identification of the Contents of Pipes and Conduits and Ducts specifies means of identifying the contents of pipes, conduits, ducts, and sheathing used to contain fluids, or for the distribution of electrical or communications services, by the use of colour, words, and symbols. It is not intended to apply to buried or normally inaccessible services.
AS 1894-1997 The Storage and Handling of Non-flammable Cryogenic and Refrigerated Liquids	This standard sets out the requirements for the storage and handling of non-flammable liquids at or below -15 degrees Celsius (°C), of Class 2.2 (non-flammable, non-toxic gases), in quantities of at least 50 litres (L) water capacity and 50 kilopascals (kPa) (gauge) working pressure, up to and including 200,000 L water capacity. This standard also applies to: The storage of non-flammable cryogenic and refrigerated liquids in pressure vessels that conform to AS 1210 (Hardbound) Pressure Vessels; and Locations that are generally industrial or commercial in nature.
AS 1940-2017 The Storage and Handling of Flammable and Combustible Liquids	Relevant storage areas will be constructed and operated in compliance with the requirements of AS 1940:2017 The Storage and Handling of Flammable and Combustible Liquids, where applicable. The standard deals specifically with Class 3 flammable and combustible liquids, however it can be applied to other classes of dangerous goods (i.e., Class 8 corrosive substances).
AS 2030.1-2009 Gas cylinders - General requirements	All gas cylinders between a capacity of 0.1 kilograms (kg) and 3,000 kg used at the HUN and WDL sites will be subject to AS 2030.1:2009 Gas Cylinders - General Requirements.
AS 2187.1-1998 Explosives – Storage, Transport and Use – Storage	The storage of explosives shall be conducted in accordance with the requirements of AS 2187.1:1998 Explosives – Storage, Transport and Use – Storage. The standard deals with the location, design, construction, and maintenance of explosives magazines.
AS/New Zealand Standard (NZS) 2243.10:2004 Safety in Laboratories – Storage of Chemicals	The requirements for the safe keeping of chemicals in packages in laboratories are described in AS/NZS 2243.10:2004 Safety in Laboratories – Storage of Chemicals. The standard includes storage of chemicals and opening of packages in a laboratory. This Standard applies to all chemical substances including hazardous substances; non-hazardous substances, such as common salt, sugar, and soda ash; dangerous goods as defined in the ADG Code, except for dangerous goods of Class 1; (Explosives), Class 6.2 (Infectious substances) or Class 7 (Radioactive substances); and combustible liquids.
AS 2809.1-2008 Road Tank Vehicles for Dangerous Goods – General Requirements for all Road Tank Vehicles	Any vehicles at the HUN and WDL site designed and manufactured specifically as dangerous goods tankers (and any conventional vehicles that are provided with transportable dangerous goods tanks) are subject to AS 2809.1:2008 Road Tank Vehicles for Dangerous Goods – General Requirements for all Road Tank Vehicles
AS 2931-1999 Selection and Use of Emergency Procedure Guides for the Transport of Dangerous Goods	AS 2931:1999 Selection and Use of Emergency Procedure Guides for the Transport of Dangerous Goods provides guidance on the selection of the AS 1678 emergency procedure guides (EPGs) and group text emergency procedure guides required when transporting dangerous goods and information on completing and using an EPG.
AS 3780-2008 The Storage and Handling of Corrosive Substances	AS 3780:2008 Storage and Handling of Corrosive Substances sets out requirements and recommendations for the safe storage and handling of corrosive substances (substances that meet the Class 8 classification criteria of

Standards	Details
	the ADG Code). The standard also applies to other dangerous goods that are assigned a Class 8 subsidiary risk by the ADG Code.
AS 4326-2008 The Storage and Handling of Oxidizing Agents	The storage and handling of oxidizing agents (i.e., ammonium nitrate) is addressed by AS 4326:2008 The Storage and Handling of Oxidizing Agents. The standard sets out requirements and precautions for storage, handling, safety, and emergency procedures for oxidizing agents that may be applicable to HUN and WDL.
AS/NZS 1596:2014 The Storage and Handling of LP Gas	This standard specifies the requirements for the location, design, construction, commissioning, and operation of installations for the storage and handling of Liquefied Petroleum Gas (LPG) including the management of emergencies.
AS/NZS 2906:2001 Fuel Containers – Portable – Plastic and Metal	All portable, petroleum-product fuel containers made of metal or plastic, of nominal capacity up to and including 25 L, intended to be refilled, and of the following types: Containers for the storage and transport of fuel; and/or Fuel tanks for boats on the HUN and WDL sites. Will be subject to AS/NZS 2906:2001 Fuel Containers - Portable-Plastic and Metal. Containers covered by this standard are suitable for use with leaded, unleaded, and super grades of petrol, two-stroke engine fuel, and kerosene and distillate and may therefore be used at the HUN and WDL sites.
AS/NZS 3833:2007 The Storage and Handling of Mixed Classes of Dangerous Goods in Packages and Intermediate Bulk Containers	Any storage of mixed classes of hydrocarbons and chemicals shall be stored in accordance with the requirements of AS/NZS 3833:2007 The Storage and Handling of Mixed Classes of Dangerous Goods in Packages and Intermediate Bulk Containers, where applicable.
AS/NZS 4452:1997 The Storage and Handling of Toxic Substances	AS/NZS 4452:1997 The Storage and Handling of Toxic Substances sets out requirements and recommendations for the safe storage and handling of toxic substances that are classified as Class 6.1 in the ADG Code, and also applies to other dangerous goods that are assigned a Class 6.1 subsidiary risk by the ADG Code; except where they are of Class 2, or where more stringent requirements apply under another relevant Standard or applicable regulation.

OTHER RELEVANT GUIDELINES

Standards	Details
Leading Practice Sustainable Development Program for the Mining Industry – Hazardous Materials Management (Commonwealth Government, 2016)	Produced by the then Commonwealth Department of Resources, Energy and Tourism as a part of the Leading Practice Sustainable Development Program for the Mining Industry series, this handbook provides guidance on the leading practice for Hazardous Materials Management in the mining industry. The handbook provides guiding principles and leading practices in the handling and storage of hazardous materials through the mine life cycle.

APPENDIX B: Hazardous Materials and Dangerous Goods Storage Locations

Redacted pursuant to condition 39 of the Minister's Approval of the 2023-2027 MMP

APPENDIX C: Huntly and Willowdale Environmental Protection Act 1986 Licences

Government of Western Australia
Department of Water and Environmental Regulation

Licence

Licence number	L6210/1991/10
Licence holder	Alcoa of Australia Limited
CAN	004 879 298
Registered business address	181-205 Davy Street Booragoon WA 6154
DWER file number	2010/002563-1
Duration	13/09/2013 to 12/09/2035
Date of issue	05/09/2013
Date of amendment	09/02/2021
Premises details	Huntly Mine Site Part of AML70/1 North Spur Rd DWELLINGUP WA 6213 As defined by the map in Schedule 1

Prescribed premises category description (Schedule 1, ***Environmental Protection Regulations 1987***)	**Assessed production capacity**
Category 5: Processing or beneficiation of metallic or non-metallic ore.	29,000,000 tonnes per annual period.

This amended licence is granted to the licence holder, subject to the attached conditions, on 9 February 2021, by:

Carmen Standring
Digitally signed by Carmen Standring
Date: 2021.02.09 12:54:02 +08'00'

A/MANAGER, RESOURCE INDUSTRIES
REGULATORY SERVICES
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Licence history

Date	Reference number	Summary of changes
13/09/2005	L6210/1991/8	Licence renewed for three years.
13/09/2008	L6210/1991/9	Licence renewed for five years.
19/04/2013	L6210/1991/9	Amendment to allow the relocation of the crusher and associated infrastructure from McCoy to the Myara mining region.
13/09/2013	L6210/1991/10	Licence renewed for five years.
29/04/2016	L6210/1991/10	Notice of amendment to extend licence expiry date to 12/09/2035 in accordance with section 59(1)(k) of the *Environmental Protection Act 1986* and DWER *Guidance statement: Licence Duration*.
7/05/2015	L6210/1991/10	Amendment to allow for the operation of the upgraded McCoy treatment system and the new Myara treatment system constructed under works approval W5360/2013/1.
9/02/2021	L6210/1991/10	Department initiated amendment to clarify sources of contaminated wastewater permitted to be treated through the wastewater treatment plants on site, update the licence template and make minor administrative changes.

Interpretation

In this licence:

(a) the words ‘including’, ‘includes’ and ‘include’ in conditions mean “including but not limited to”, and similar, as appropriate;

(b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;

(c) where tables are used in a condition, each row in a table constitutes a separate condition;

(d) any reference to an Australian or other standard, guideline, or code of practice in this licence:

  (i) if dated, refers to that particular version; and

  (ii) if not dated, refers to the latest version and therefore may be subject to change over time;

(e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and

(f) unless specified otherwise, all definitions are in accordance with the EP Act.

NOTE: This licence requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this licence.

Licence conditions

The licence holder must ensure that the following conditions are complied with:

Infrastructure and equipment

1. The licence holder must ensure that the site infrastructure and equipment listed in Table 1 and located at the corresponding infrastructure location are maintained and operated in accordance with the corresponding operational requirement set out in Table 1.

Table 1: Infrastructure and equipment requirements

Site infrastructure and equipment	Operational requirement	Infrastructure location
McCoy Wastewater Treatment Plant (WWTP)	WWTP is approved to treat wastewater from the following sources only: – fuel bays; – heavy vehicle wash down bay; – heavy vehicle workshop; – heavy vehicle silt drying beds; – hydrocarbon contaminated water collected from onsite drainage sumps (wastewater within sumps as a result of firefighting activities must not be treated through WWTP); – McCoy WWTP sludge drying beds; and – untreated wastewater from the Myara WWTP (when Myara WWTP is not in service).	As depicted in Schedule 1, Figure 2.
Myara Wastewater Treatment Plant (WWTP)	WWTP is approved to treat wastewater from the following sources only: – heavy vehicle fuel bay; – light vehicle fuel bay; – fuel delivery areas; – hydrocarbon contaminated water collected from onsite drainage sumps (wastewater within sumps as a result of firefighting activities must not be treated through WWTP); – contractor's workshops and laydown areas; and – contractors refueling area.	As depicted in Schedule 1, Figure 3.

2. The Licence Holder must install and maintain sufficient on-site storage capacity, such that in the event of wastewater treatment plant maintenance or breakdown, untreated wastewaters that exceed the limits specified in condition 7, Table 3 are not discharged to the environment.

3. The Licence Holder must manage all wastewater treatment and storage ponds such that:

(a) overtopping of the ponds does not occur; and

(b) the integrity of the containment infrastructure is maintained.

4. The Licence Holder must treat contaminated or potentially contaminated wastewater prior to discharge to the McCoy Sumps MC1, MC2 and MC3 and/or Myara Batching Tanks US1, US2 and US3.

Monitoring

5. The Licence Holder must ensure that:

(a) all water samples are collected and preserved in accordance with AS/NZS 5667.1;

(b) all wastewater sampling is conducted in accordance with AS/NZS 5667.10; and

(c) all samples are submitted to a laboratory with current NATA accreditation for the parameters to be measured.

6. The Licence holder must undertake the wastewater monitoring in Table 2 according to the specifications in that table.

Table 2: Wastewater monitoring program

Monitoring point	Parameter	Units	Frequency
McCoy WWTP Sump MC1 Sump MC2 Sump MC3 **Myara WWTP** Batching Tank US1 Batching Tank US2 Batching Tank US3	pH	N/A	Prior to each discharge of wastewater unless there has been no addition of treated wastewater to the sumps or batching tanks since the last sampling event.
	Total dissolved solids, surfactants (as MBAS), total phosphorus, oil & grease, TRH, PAH, chromium, copper and zinc	mg/L	
	Discharge volume	kL	Continuous

7. The Licence Holder must not cause or allow the discharge of wastewater to the environment with parameters greater than the limits listed in Table 3.

Table 3: Wastewater discharge limits.

Emission source	Parameter	Limit (including units)	Averaging period
McCoy WWTP Sump MC1; Sump MC2; and Sump MC3 **Myara WWTP** Batching Tank US1; Batching Tank US2; and Batching Tank US3	pH	Within the range of 5.5 to 9.0	Spot sample
	Total dissolved solids	1,000 mg/L	
	Oil & grease	5 mg/L	
	Surfactants (as MBAS)		
	Zinc		
	Total phosphorus	2 mg/L	
	Chromium	0.06 mg/L	
	Copper	1 mg/L	

8. The Licence Holder must dispose of wastewater that exceeds the limits specified in condition 7 to a facility licensed to accept the wastewater.

Records and reporting

9. The Licence Holder must notify the CEO in writing as soon as is practicable upon becoming aware of any discharge of wastewater to the environment that exceeds any limit specified in condition 7 including:

(a) the date, time and probable reason for the exceedance;

(b) an estimate of the period over which the exceedance occurred; and

(c) an estimate of the extent of the discharge over that period and indication of known or potential environmental impacts.

10. The Licence Holder must provide a report on its investigations into any exceedance reported under condition 9 within 7 usual working days of becoming aware of the exceedance, and it shall include, but not be limited to:

(a) the date, time and reason for the exceedance;

(b) the period over which the exceedance occurred;

(c) the extent of the discharge over that period and potential or known environmental consequences;

(d) corrective action taken or planned to mitigate adverse environmental consequences; and

(e) corrective action taken or planned to prevent a recurrence of the exceedance.

11. The licence holder must maintain accurate and auditable books including the following records, information, reports, and data required by this licence:

(a) the calculation of fees payable in respect of this licence; and

(b) monitoring programmes undertaken in accordance with condition 6 of this licence.

12. The books specified under condition 11 must:

(a) be legible;

(b) if amended, be amended in such a way that the original version(s) and any subsequent amendments remain legible and are capable of retrieval;

(c) be retained by the licence holder for the duration of the licence; and

(d) be available to be produced to an inspector or the CEO as required.

13. The licence holder must:

(a) undertake an audit of their compliance with the conditions of this licence during the preceding annual period; and

(b) prepare and submit to the CEO by no later than 31 March after the end of that annual period an Annual Audit Compliance Report (AACR) in the approved form.

14. The Licence Holder must submit to the CEO by no later than the 31 March after the end of each annual period, an annual environmental report for that annual period for the conditions listed in Table 4, and which provides information in accordance with the corresponding requirement set out in Table 4:

Table 4: Annual Environmental report

Condition	Requirement
-	an overview of the operations and processes carried out on the premises together with the quantity of ore processed during the annual period.
6	Results of wastewater monitoring in accordance with condition 6 including wastewater flow as a monthly cumulative volume.
6 and 7	An assessment of wastewater monitoring results obtained in accordance with condition 6 against previous monitoring results and the limits specified in condition 7.
9	A summary table of exceedances reported under condition 9 together with details relating to actions taken to minimise the likelihood of re-occurrence.
-	A table cross referencing the quantity of the wastes (sludge) generated from the wastewater treatment plants during the annual period and the total annual volume of treated wastewater discharged from the treatment plants (McCoy Sumps MC1, MC2 and MC3 or Myara Batching Tanks US1, US2 and US3).
13	Summary of compliance with licence conditions (AACR)[1]

Note 1: Annual Audit Compliance Report form can be found on the Departments website.

Definitions

In this licence, the terms in Table 5 have the meanings defined.

Table 5: Definitions

Term	Definition
ACN	Australian Company Number
Annual Audit Compliance Report (AACR)	means a report submitted in a format approved by the CEO (relevant guidelines and templates may be available on the Department's website).
AS/NZS 5667.1	means the Australian Standard AS/NZS 5667.1 *Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples.*
AS/NZS 5667.10	means the Australian Standard AS/NZS 5667.10 *Water Quality – Sampling – Guidance on sampling of waste waters.*
annual period	a 12-month period commencing from 1 January until 31 December of the immediately following year.
books	has the same meaning given to that term under the EP Act.
CEO	means Chief Executive Officer of the Department. "submit to / notify the CEO" (or similar), means either: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 or: info@dwer.wa.gov.au
Department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
discharge	has the same meaning given to that term under the EP Act.
emission	has the same meaning given to that term under the EP Act.
EP Act	*Environmental Protection Act 1986* (WA)
licence	refers to this document, which evidences the grant of a licence by the CEO under section 57 of the EP Act, subject to the specified conditions contained within.
licence holder	refers to the occupier of the premises, being the person specified on the front of the licence as the person to whom this licence has been granted.
mg/L	means milligrams per litre.
MBAS	means methylene blue active substances.

Term	Definition
NATA	means the body known as the National Association of Testing Authorities, Australia.
NATA accredited	means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis.
premises	refers to the premises to which this licence applies, as specified at the front of this licence and as shown on the premises map (Figure 1) in Schedule 1 to this licence.
prescribed premises	has the same meaning given to that term under the EP Act.
PAH	means polycyclic aromatic hydrocarbons
Spot sample	means a discrete sample representative at the time and place at which the sample is taken.
TRH	means total recoverable hydrocarbons
usual working day	means 0800 – 1700 hours, Monday to Friday excluding public holidays in Western Australia.

END OF CONDITIONS

Schedule 1: Maps

Premises map

The boundary of the prescribed premises is shown in the map below (Figure 1). The brown line depicts the Premises boundary.

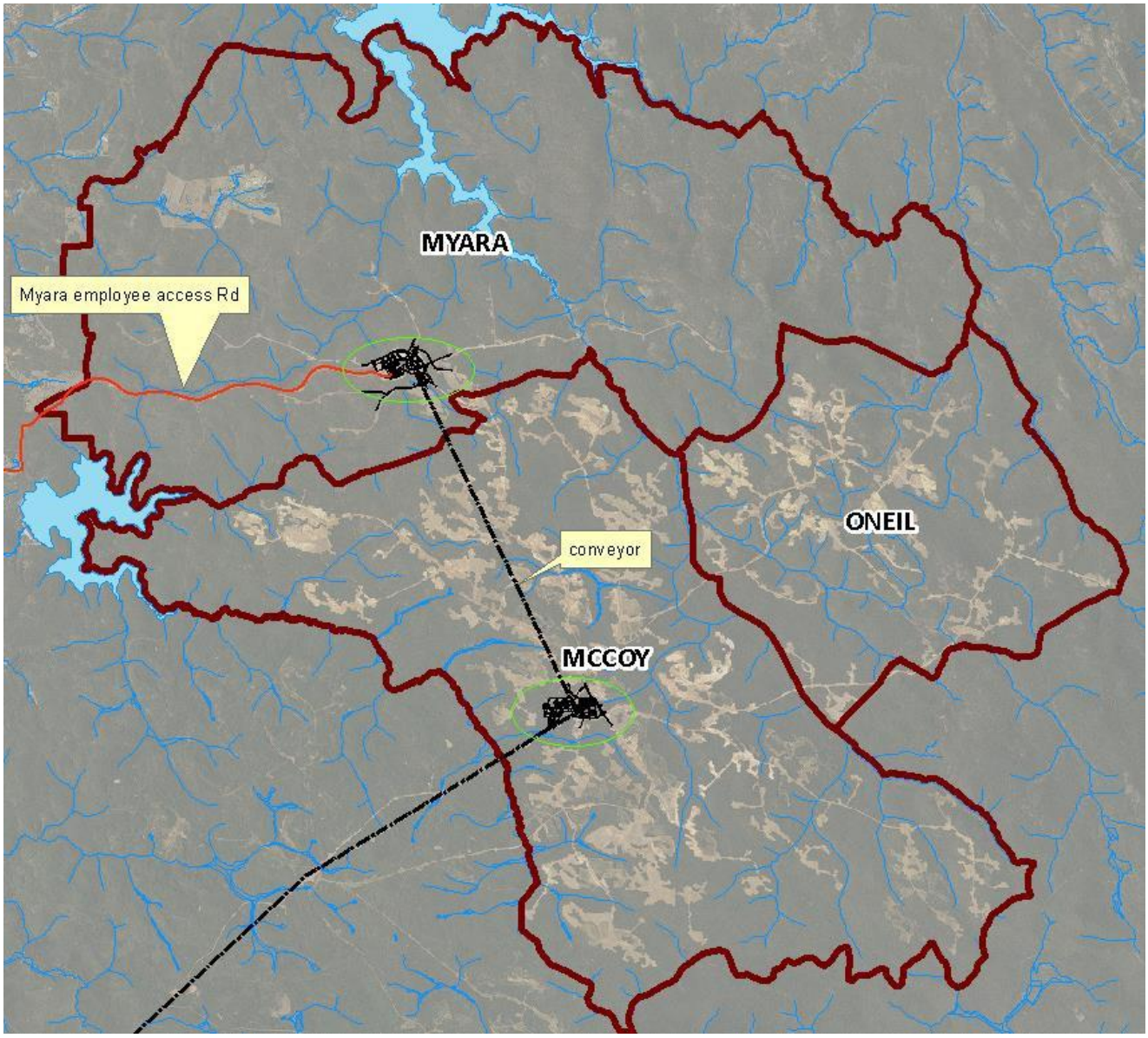


Figure 1: Map of the boundary of the prescribed premises.

Maps of monitoring points, WWTPs and source infrastructure locations.

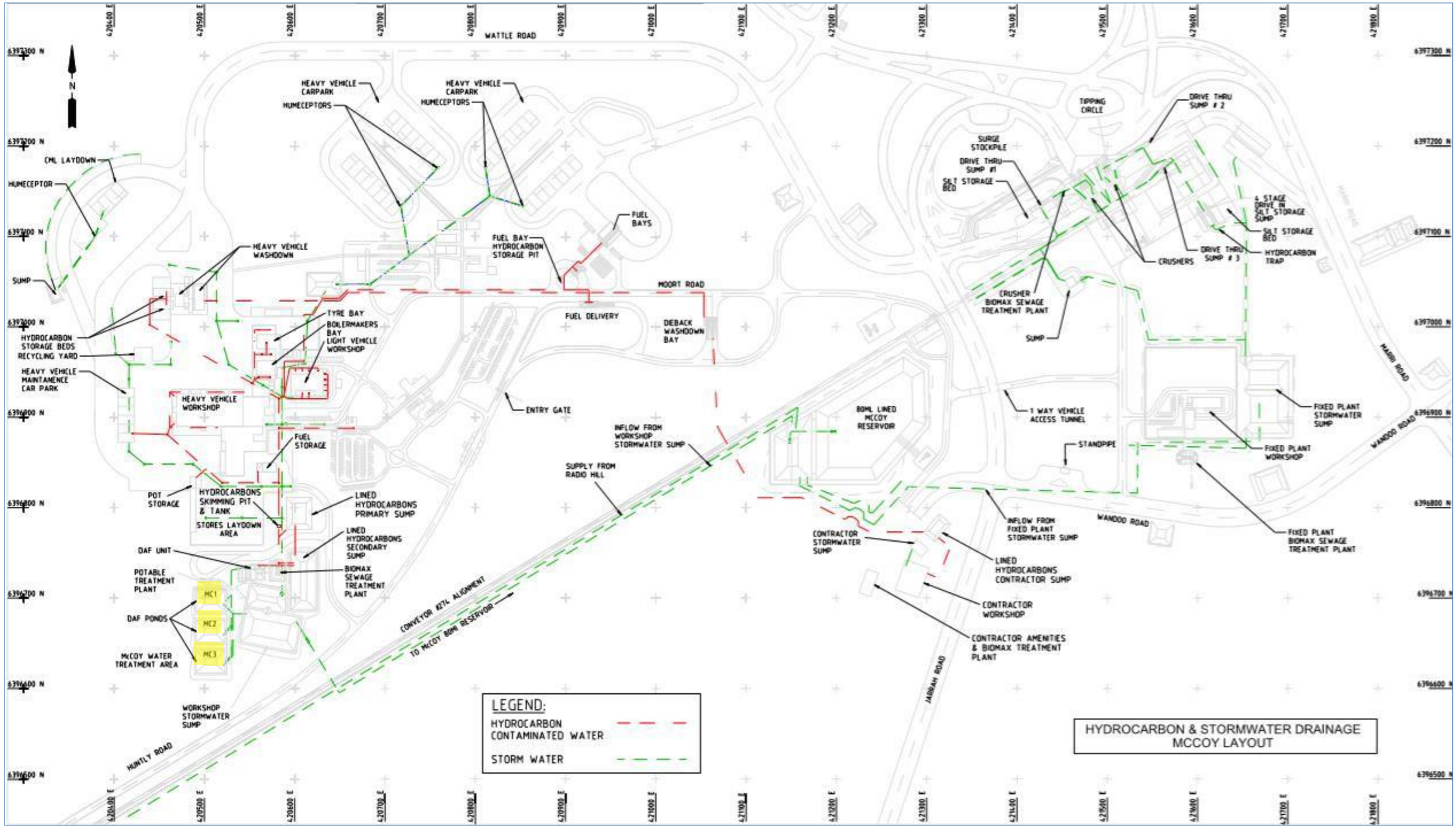


Figure 2: McCoy operations area. McCoy monitoring points highlighted in yellow.

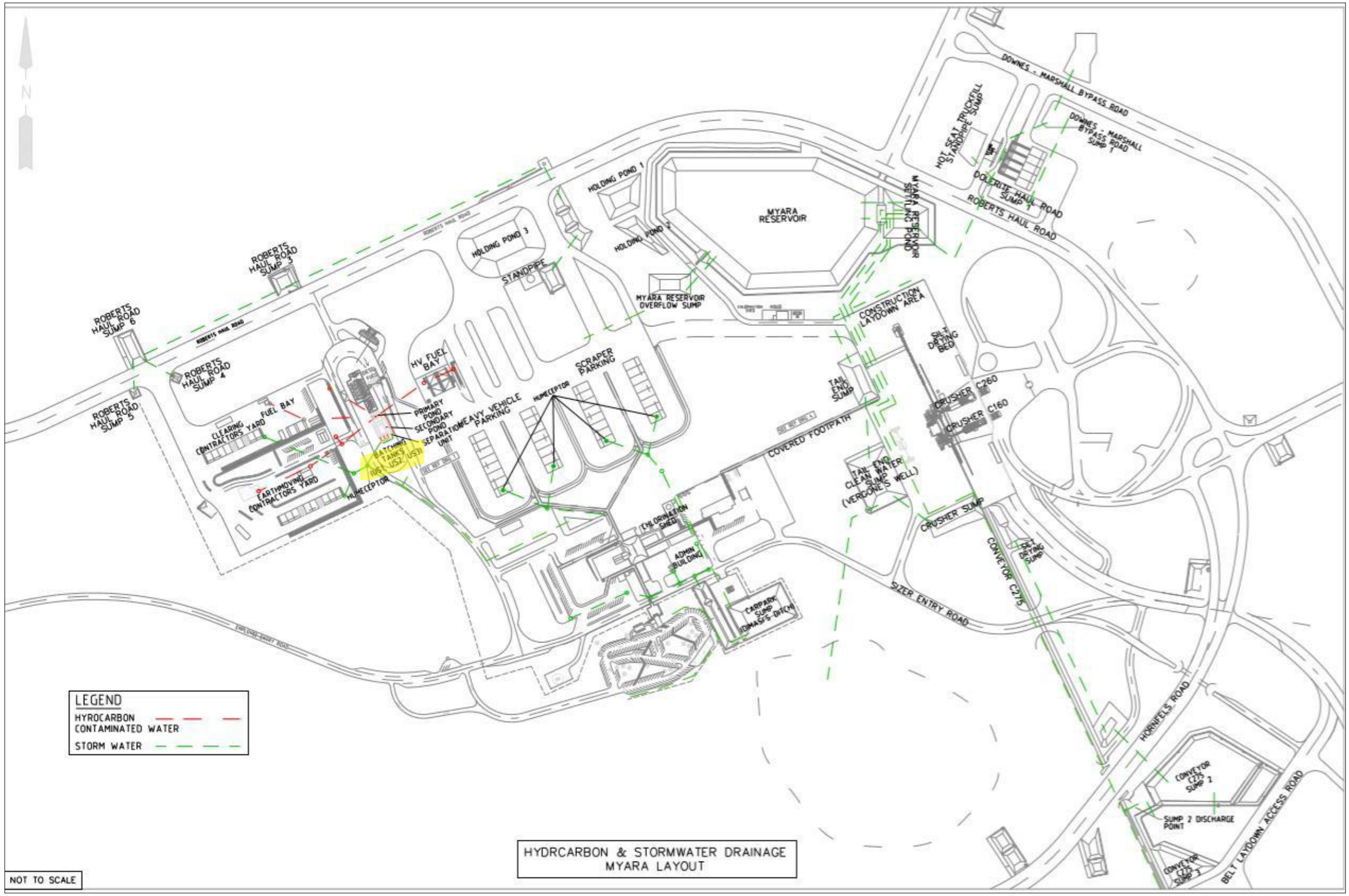


Figure 3: Myara operations area. Myara monitoring points highlighted in yellow.

Government of Western Australia
Department of Water and Environmental Regulation

Licence

Licence number	L6465/1989/10
Licence holder	Alcoa of Australia Limited
ACN	004 879 298
Registered business address	181-205 Davy Street BOORAGOON WA 6154
DWER file number	2010/007470-1
Duration	05/10/2015 to 04/10/2031
Date of issue	01/10/2015
Date of amendment	20/02/2024
Premises details	Willowdale Mine Part of Mineral Lease 1SA Willowdale Rd (via Wagerup Refinery Access Rd) WAROONA WA 6215 As defined by the maps in Schedule 1

Prescribed premises category description (Schedule 1, *Environmental Protection Regulations 1987*)	**Assessed production capacity**
Category 05: Processing or beneficiation of metallic or non-metallic ore	16,000,000 tonnes per year

This amended licence is granted to the licence holder, subject to the attached conditions, on 20 February 2024, by:

A/SENIOR MANAGER, RESOURCE INDUSTRIES
REGULATORY SERVICES
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Licence history

Date	Reference number	Summary of changes
01/10/2000	L6465/1989/1	Licence granted.
11/10/2001	L6465/1989/2	Renewed for one year.
1/10/2002	L6465/1989/3	Renewed for one year.
18/9/2003	L6465/1989/4	Renewed for one year.
5/10/2004	L6465/1989/5	Renewed for one year.
5/10/2005	L6465/1989/6	Renewed for five years.
5/10/2010	L6465/1989/9	Renewed for five years.
5/10/2015	L6465/1989/10	Renewed for five years.
05/05/2020	L6465/1989/10	Licence amendment to extend the premises boundary and authorise relocation of a rock crusher from the Orion mine region to the Larego mine region. New overland ore conveyor from Larego to Arundel, and new wastewater treatment and storage infrastructure
30/11/2021	L6465/1989/10	Licence amendment to extend the timeframe for completion of infrastructure associated with mining moving to Larego area.
20/02/2024	L6465/1989/10	Licence amendment for construction and operation of a PFAS water treatment plant at Arundel mining area, upgrades to stormwater management at Arundel (new stormwater dams, oil-water separator and pipelined). Review of noise emissions from crushing infrastructure associated with move to Larego mining region.

Interpretation

In this licence:

(a) the words ‘including’, ‘includes’ and ‘include’ in conditions mean “including but not limited to”, and similar, as appropriate;

(b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;

(c) where tables are used in a condition, each row in a table constitutes a separate condition;

(d) any reference to an Australian or other standard, guideline, or code of practice in this licence:

  (i) if dated, refers to that particular version; and

  (ii) if not dated, refers to the latest version and therefore may be subject to change over time;

(e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and

(f) unless specified otherwise, all definitions are in accordance with the EP Act.

NOTE: This licence requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this licence.

Licence conditions

The licence holder must ensure that the following conditions are complied with:

1. The licence holder must construct and/or install the infrastructure listed in Table 1, in accordance with;

(a) the corresponding design and construction requirement / installation requirement; and

(b) at the corresponding infrastructure location; and

(c) within the corresponding timeframe,

as set out in Table 1.

Table 1: Design and construction requirements / installation requirements

Infrastructure	Design and construction / installation requirement	Infrastructure location	Timeframe
PTU	• Capacity to treat 40 m^3 per hour PFAS contaminated water • Granular Activated Carbon / Ion Exchange resin treatment technology • Treatment levels designed to meet limit of reporting for ultratrace analysis of PFAS (as listed in condition 20, Table 10) • To be built in a concrete bunded area to contain leaks/spills, any overflow to be directed back to PT-001 or PT-002 • Tanks to have high level alarms and float switches to prevent system overflows. The units will be managed via the plants Programmable logic controller (PLC) and alert operations. • Constructed as per layout shown in Figure 3 of Schedule 1	Arundel mining area as shown in Figure 2 of Schedule 1 and Arundel infrastructure and equipment as shown in Figure 8 in Schedule 1: Arundel site layout and drainage plan	N/A
Oil / water separator and Arundel stormwater collection pond (ASW3) at the Arundel workshops	Oil / water separator: • Capacity to treat 30 L/minute hydrocarbon contaminated water • Treatment levels designed to remove a minimum of 90% solids reduction and 90% Oils and Grease reduction • 1,000L polyethylene solids interceptor tank • To be installed in a concrete bunded area to contain leaks/spills, any overflow to be directed back to stormwater dam Stormwater collection pond: • Storage capacity of 1.5 ML • Clay liner and HDPE liner to meet maximum permeability of 1 x 10^{-9} m/s		
Pipelines from Arundel mining area to PTU, and from PTU to McKnoes Brook discharge point	• Pipelines from PTU to McKnoes brook discharge point to have: - Capacity of 72 m^3/hour - 125 mm diameter HDPE pipelines; and - be installed above ground, and have leak detection systems installed;		

Infrastructure	Design and construction / installation requirement	Infrastructure location	Timeframe
	• Pipelines conveying PFAS-contaminated or hydrocarbon contaminated water must be installed above ground, be double skinned and have leak detection systems installed • Pipelines to be laid in existing easements • Flowmeter(s) installed to record volumes treated and discharged • Discharge point to McKnoes Brook to be installed over existing rock dominated channel to control erosion and sedimentation, preventing damage to bed and banks		
Upgrades to Anpress Pre-treatment sump (shotcrete cell) (ASP2)	• Storage Capacity up to 280 kL • Lined to meet maximum permeability of 2.27 x 10^{-17} m/s • Minimum design freeboard 1 meter (sufficient to cater for a 1:100 year AEP 72 hr rainfall event)	Arundel infrastructure and equipment as shown in Figure 8 of Schedule 1: Arundle site layout and drainage plan	
Anpress Pre-treatment sump (ASP3)	• Storage Capacity up to 1.5 ML • Lined to meet maximum permeability of 2.27 x 10^{-17} m/s • Minimum design freeboard 1 m (sufficient to cater for a 1:100 year AEP 72 hr rainfall event)		
Noise mitigation infrastructure and works at Arundel	• Installation of 2.5km enclosure around Conveyor 371 • Sealing of gaps between acoustic panels on the upper floor of the Arundel transfer station.	Conveyor 371 enclosure details as shown in Figure 4 of Schedule 1	31 December 2025
McKnoes Brook water level monitoring device	• Must be capable monitoring instantaneous (daily) water levels to allow streamflow calculations • Streamflow monitoring device / instrumentation to be installed shall be determined in consultation with DWER (Environmental Water Planning and South West regional hydrologists)	Upstream of the McKnoes Brook discharge point	Prior to any discharge from the PTU discharge pipeline to McKnoes Brook

2. The licence holder must within 30 days of each item of infrastructure required by condition 1 being constructed:

(a) undertake an audit of their compliance with the requirements of condition 1; and

(b) prepare and submit to the CEO an audit report on that compliance.

3. The report required by condition 2(b), must include as a minimum the following:

(a) certification by a suitably qualified civil engineer that the items of infrastructure or component(s) thereof, as specified in condition 1, have been constructed in accordance with the relevant requirements specified in condition 1;

(b) as constructed plans and a detailed site plan for each item of infrastructure or component of infrastructure specified in condition 1; and

(c) be signed by a person authorised to represent the licence holder and contains the printed name and position of that person.

Environmental Commissioning

4. Any environmental commissioning activities undertaken for an item of infrastructure specified in Table 2 must only be carried out:

(a) in accordance with the corresponding commissioning requirements; and

(b) for the corresponding authorised commissioning duration.

Table 2: Environmental commissioning requirements

Infrastructure	Commissioning requirements	Authorised commissioning duration
PTU	• Daily inspection of PTU to ensure integrity and freeboards maintained. • Any spills or leaks from PTU tanks and modules to be directed back to APTD-001 and APTD-002. • An alarm system must be operated to notify the operator of high tank levels with the PTU. • Sampling and analysis of treated water required prior to discharge in accordance with Condition 5 to ensure it complies with approved discharge criteria outlined in Table 10.	For a period not exceeding 90 calendar days in aggregate.

5. The licence holder must undertake the monitoring in Table 3 according to the specifications in that table.

Table 3: Monitoring of treated water during commissioning

Monitoring point reference	Process description	Parameter	Unit	Frequency	Averaging period	Method
Arundel Treated water Ponds 1, 2 and 3 sample points	Discharge from PTU to Treated Water Ponds 1, 2 and 3 to McKnoes Brook (During Commissioning only)	Cumulative volume	m^3 and tonnes	Continuous during discharge	Daily	-
		pH[1]	-	Prior to any discharge from Treated Water ponds 1, 2 or 3 to McKnoes Brook	Spot sample	As per condition 21
		Total Dissolved Solids	mg/L			
		Total Suspended Solids				
		Chloride				
		Nitrate				
		Magnesium				
		Sodium				
		Sulfate				
		Surfactants as MBAS				
		Total Nitrogen				
		Total Phosphorus				
		Oil and Grease[2]				
		TRH				
		BTEX				
		PAH				
		Aluminium				
		Arsenic				
		Barium				
		Cadmium				
		Chromium				
		Cobalt				
		Copper				
		Lead				
		Manganese				
		Mercury				
		Molybdenum				
		Nickel				
		Zinc				
		21 PFAS compounds as listed in Table 10	µg/L			

Note 1: In-field non-NATA accredited analysis permitted.

Note 2: to be sampled with USEPA method 5520B

Noise emissions

6. Within 30 days of the noise mitigation infrastructure and works listed in Table 1 being completed, the licence holder must retain the services of a person qualified and experienced in the area of environmental noise assessment and who by their qualifications and experience is eligible to hold membership of the Australian Acoustical Society or the Australian Association of Acoustical Consultants to:

(a) investigate the nature and extent of noise emissions from the Arundel mining area infrastructure, particularly in relation to the noise levels experienced at the nearest noise sensitive receptor (R1) as shown in Figure 5;

(b) assess in accordance with the methodology required in the *Environmental Protection (Noise) Regulations 1997*, the compliance of the noise emissions from the Arundel mining area infrastructure, against the relevant assigned levels specified in those Regulations; and

(c) compile and submit to the licence holder within 60 days of completion of the assessment required under condition 6(b), a report in accordance with condition.

7. A report prepared pursuant to condition 6(c) is to include:

(a) a description of the methods used for monitoring and/or modelling of noise emissions from the Arundel mining area infrastructure;

(b) details and the results of the investigation undertaken pursuant to condition 6(a);

(c) details and results of the assessment of the noise emissions from the Arundel mining area infrastructure, against the relevant assigned levels in the *Environmental Protection (Noise) Regulations 1997* undertaken pursuant to condition 6(b); and

(d) an assessment of noise levels against the most recent previous noise assessment.

8. The licence holder must submit to the CEO the report prepared pursuant to condition 6(c) within 14 days of it being finalised.

9. Where an assessment pursuant to condition 6(b) indicates that noise emissions from the Arundel mining area infrastructure do not comply with the relevant assigned levels in the *Environmental Protection (Noise) Regulations 1997*, the license holder must:

(a) within 60 days of receiving an assessment report pursuant to condition 6(c) prepare a plan to ensure the undertaking of the licensed activity will no longer lead to any contravention of the *Environmental Protection (Noise) Regulations 1997*; and

(b) provide to the CEO a copy of the plan prepared pursuant to condition 9(a) within 30 days of its preparation.

Acceptance and throughput restrictions

10. The licence holder must only accept onto the premises waste of a waste type, which does not exceed the corresponding rate at which waste is received, and which meets the corresponding acceptance specification set out in Table 4.

Table 4: Types of waste authorised to be accepted and treated at the premises

Liquid waste type[1]	Waste code	Quantity limit	Specifications
PFAS contaminated waters	M270	219,000 kL per annual period	• Tankered from sumps within the Orion mining area to Arundel mining area and transferred to APTD-001 or APTD-002 for storage prior to being directed to the PTU for treatment. • Tanker route must not traverse the Reservoir Protection Zone for the Samson Brook Catchment.

Note 1: Additional requirements for the acceptance of controlled waste are set out in the *Environmental Protection (Controlled Waste) Regulations 2004*.

11. The licence holder must ensure that the waste types specified in Table 5 are only subjected to the corresponding processes, subject to the corresponding process limits and/or specifications.

Table 5: Waste processing

Waste type	Processes	Process limits and/or specifications
Sludge from PTU	• To be dewatered and analysed for PFAS chemicals listed in Table 10 by a NATA accredited laboratory, prior to disposal. • Dewatered water to be returned to APTD-001 or APTD-002	• Must be stored in impervious, sealed containers prior to being disposed of to an appropriately licensed facility. • Any leachate generated must be returned to APTD-001 or APTD-002.
Sludge from APTD-001 and APTD-002		
Waste zeolite	Removal and temporary storage prior to offsite disposal	
Waste granular activated carbon		
Waste Anionic exchange resin (PFAS-specific, single use)		

Infrastructure and equipment

12. The licence holder must ensure that the site infrastructure and equipment listed in Table 6 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 6.

Table 6: Infrastructure and equipment requirements

Site infrastructure and equipment	Operational requirement	Infrastructure location
Larego 360 Crusher	• Dust suppression to be integrated with the crusher • Spray bars within the tip hopper to be utilised as required, when dust generation occurs during ore transfer into the crusher • Crushing plant area bunded and operated so that any spillage of contaminated water will be directed to humeceptors prior to reporting to the Larego water storage reservoir	Larego mining area as shown in Figure 11 and Figure 12 of Schedule 1

Site infrastructure and equipment	Operational requirement	Infrastructure location
Larego Water storage reservoir	• Storage capacity of 47ML • Maintain HDPE liner to prevent water loss via infiltration • Maintain rock pitched emergency spillway above the maximum level • Maintain minimum freeboard of 1 meter.	
Larego Wastewater Storage Ponds (Oily water pond and DAF holding sump)	• HDPE lined Oily water sump capacity of 100 kL and HDPE lined DAF holding feed pond capacity of 2.6 ML • Maintain a floating surface skimmer in the Oily water pond • Three HDPE lined DAF treated water ponds, each with a capacity of 1ML • Impervious wastewater service area to be maintained and operated so that any spillage is transferred back into the oily water pond	
Larego Dissolved Air Floatation (DAF) Water Treatment	• The design throughput capacity of the DAF shall be maintained at 40m^3/hr • Maintain pretreatment oily wastewater sumps with sediment traps and hydrocarbon traps, and capability for mounting a belt skimmer allowing removal of free surface hydrocarbons • UV Stabilised polyethylene tank, designed to AS4766, to be maintained and operated to capture the oil from surface skimmer • Wastewater to be treated to the discharge criteria limits stipulated in Condition 20 • Following water quality testing, successful water quality results allow the transfer of treated water to the Flinders C Sump or Larego Water Storage Reservoir.	
Larego Stormwater management	• HumeCeptor hydrodynamic separators (x 2) to be maintained and operated to remove hydrocarbon and sediments entrained in stormwater runoff • Stormwater shall be diverted around and away from the crushing plant, stockpile, washdown and workshops areas by diversion drains • Drainage at the site to be maintained and operated in accordance with AS/NZS 3500.3 • Retention sump maintained and operated to contain runoff from the crushing plant, stockpiles, washdown and workshops areas so that there is zero discharge of contaminated stormwater from the site for a 1 in 100 annual exceedance probability (AEP) storm event over 72 hours.	

Site infrastructure and equipment	Operational requirement	Infrastructure location
Arundel 371/374 transfer station	• A wide arc (spray) water cannon directed into the transfer chute to be utilised as required, when operating conditions generate excessive dust • Low noise idlers maintained and operated while transfer station is operating • Acoustic shielding and noise mitigation controls to be maintained and operated where required to ensure compliance with *Environmental Protection (Noise) Regulations 1987*	Arundel Mining Area as shown in Figure 8, Figure 9 and Figure 10 of Schedule 1
371 and 374 Conveyors	• Conveyors are fitted with covers for dust control • Transfer stations are fitted with water sprays • Acoustic shielding and noise mitigation controls to be maintained and operated where required to ensure compliance with *Environmental Protection (Noise) Regulations 1987*	
Arundel Pre-treatment dams APTD-001 and APTD-002	Each Pre-treatment Dam must be operated to maintain: • APTD-001 with storage capacity of 50 ML and APTD-002 with storage capacity of 60 ML • clay liner and HDPE liner providing less than 1 x 10^{-9} m/s permeability • Total minimum freeboard allowance of 1,000 mm • Visual marker installed along embankment for freeboard monitoring.	
PTU	• Must be operated in accordance with manufacturer's specifications • Drains and sumps to be maintained with sufficient capacity to allow capture of any spills; • Any spills or leaks from PTU tanks and modules to be directed back to APTD-001 or APTD-002 • An alarm system must be operated to notify the operator of high tank levels within the PTU • Tanks will have high level alarms and float switches to prevent system overflows. The units will be managed via the plants PLC and alert operations.	
PTU Treated Water Dams 1, 2 and 3	Each Treated Water Dam must be operated to maintain: • storage design capacity of 4.5 ML (combined total of 13.5 ML) • clay liner and also HDPE liner providing less than 1 x 10^{-9} m/s permeability • Total freeboard allowance of 500 mm	

Site infrastructure and equipment	Operational requirement	Infrastructure location
Pipelines	• Pipelines for conveying PFAS-contaminated water must be double skinned and have leak detection systems installed which are to be maintained during operations • Discharge point to McKnoes Brook to be maintained over existing rock dominated channel • Flowmeter(s) to be maintained to enable discharge rates to be recorded	
Orion Sumps 1, 2 and 3	• Orion Sump 3 must be maintained and operated with a minimum freeboard of 50% of the sump capacity • Orion Sump 3 HDPE liner must be maintained to prevent water loss via infiltration • Orion Sumps 1 and 2 must be maintained and operated with a minimum freeboard of 30% of each sump capacity	Orion Mining Area as shown in Figure 7 of Schedule 1

13. The licence holder must:

(a) undertake inspections as detailed in Table 7;

(b) where an inspection has identified that a requirement as detailed in Table 7 is not met, take corrective action within 30 calendar days to mitigate adverse environmental consequences; and

(c) maintain a record of all inspections undertaken.

Table 7: Inspection of infrastructure

Scope of inspection	Inspection requirement	Frequency of inspection	Location
Dams and sumps at Orion, Arundel and Larego	• Freeboard to all dams to ensure compliance with freeboard requirements specified in Table 6	Daily	As shown in Figure 7, Figure 8, and Figure 11 of Schedule 1.
Arundel Pre-treatment dams APTD-001 and APTD-002	• visual inspection to ensure compliance with freeboard requirements specified in Table 6		As shown in Figure 8 of Schedule 1.
All pipelines connected to the PTU	• Visual inspection to confirm integrity of pipes and no leaks present.		Not shown
Larego Water Storage Reservoir	• Visual inspection to confirm capacity is available.		As shown in Figure 11 of Schedule 1.
DAF Water Treatment Facility pipelines and bunding	• Visual inspection to confirm integrity of pipes and containment infrastructure and that no leaks are present.		As shown in Figure 2 of Schedule 1

Scope of inspection	Inspection requirement	Frequency of inspection	Location
McKnoes Brook discharge point	• Weekly inspection to confirm integrity of discharge point and existing rock dominated channel to confirm no sedimentation, erosion or scouring of bed and banks	Weekly	As shown in Figure 2 of Schedule 1

Emissions and discharges

General emissions

14. The licence holder must as soon as practicable recover, or remove and dispose of, spills of environmentally hazardous materials including PFAS-contaminated water, fuel, oil, or other hydrocarbons, whether inside or outside an engineered containment system.

15. The licence holder must ensure that all material used for the recovery, removal, and/or disposal of environmentally hazardous materials is stored in an impermeable container prior to disposal at an appropriately authorised facility.

16. The Licence holder must install and maintain diversion drains and bunds to minimize the volume of stormwater runoff from entering operational areas with potentially contaminated or contaminated stormwater being captured and prevented from being released into the environment.

Dust emissions

17. The licence holder must manage dust generation at the premises by:

(a) minimising dust from unsealed roads and exposed areas via the use of water carts or other alternate methods; and

(b) reducing or limiting dust generating activities at product and waste stockpiles.

18. The licence holder must ensure that where waste is emitted to surface water or land from the emission points in Table 8 and identified on the map of emission points in Schedule 1, it is done so in accordance with the conditions of this licence.

Table 8: Authorised discharge points

Emission	Discharge point	Discharge point location
Treated water processed via oil / water separators and the Arundel PTU to meet the discharge limit criteria specified in Table 10	McKnoes Brook	As shown in Figure 2 Schedule 1: McKnoes Brook Discharge Point
Treated wastewater from DAF Sumps 1, 2 and 3 (as shown in Figure 12 in Schedule 1, labelled as DAF Treated Water Ponds)	Flinders C Sump or Larego Water Storage Reservoir	As shown in Figure 12 of Schedule 1

19. The licence holder must ensure that emissions listed in Table 9 are released from the discharge point in accordance with the authorised discharge release rates specified in Table 9.

Table 9: Authorised discharge release rates

Emission	Discharge point	Authorised release rate[1]
Treated water processed via oil / water separators and the Arundel PTU	McKnoes Brook as shown in Figure 2, Schedule 1: McKnoes Brook Discharge Point	Not more than 10 L/second in a continuous release rate
		Not more than 20 L/second release rate for 60 hours followed by 60 hours with no discharge, repeating.

Note 1: as measured by the McKnoes Brook discharge pipeline flowmeter

20. The licence holder must ensure that emissions from the discharge points listed in Table 10 do not exceed the parameter concentration limits specified in Table 10 when monitored in accordance with condition 5 and 25.

Table 10: Emission and discharge limits

Discharge point	Parameter	Limit	Unit
McKnoes Brook (sample locations from Arundel Treated Water Dams 1, 2 and 3)	pH[1]	6.5 - 8	n/a
	Total Dissolved Solids	1,000	mg/L
	Total Suspended Solids	25	
	Surfactants as MBAS	5	
	Total Phosphorus	0.2	
	Oil and Grease4	5	
	Total Recoverable Hydrocarbons	5	
	Chromium	0.0033	
	Copper	0.0014	
	Zinc	0.008	
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)[2]	0.001 or <LOR	µg/L
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)[2]	0.001 or <LOR	
	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	0.005	
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	0.005	
	Perfluoro-1-octanesulfonamidoacetic acid (FOSAA)[2]	0.005 or <LOR	
	Perfluorobutanesulfonic acid (PFBS)[2]	0.001 or <LOR	
	Perfluorobutanoic acid (PFBA)[2]	0.005 or <LOR	
	Perfluorodecanesulfonic acid (PFDS) (free acid)	0.001	
	Perfluorodecanoic acid (PFDA)	0.001	
	Perfluoroheptanesulfonic acid (PFHpS)	0.001	
	Perfluoroheptanoic acid (PFHpA)	0.001	
	Perfluorohexane sulfonic acid (PFHxS)	0.001	

Discharge point	Parameter	Limit	Unit
McKnoes Brook (sample locations from Arundel Treated Water Dams 1, 2 and 3)	Perfluorohexanoic acid (PFHxA)	0.001	
	Perfluorononanesulfonic acid (PFNS)	0.001	
	Perfluorononanoic acid (PFNA)	0.001	
	Perfluorooctane sulfonic acid (PFOS)	0.0002	
	Perfluorooctanoic acid (PFOA)	0.001	
	Perfluoropentane sulfonic acid (PFPeS)[2]	0.001 or <LOR	
	Perfluoropentanoic acid (PFPeA)[2]	0.001 or <LOR	
	Perfluorotridecanoic acid (PFTrDA)	0.001	
	Perfluoroundecanoic acid (PFUnDA or PFUnA)	0.001	
Flinders C Sump and Larego Water Storage Reservoir (discharge from DAF Treated Water Ponds 1, 2 and 3) (as shown in Figure 11 in Schedule 1)	pH[1]	4.7 - 9	n/a
	Total Dissolved Solids	1,000	mg/L
	Total Suspended Solids	80	
	Surfactants as MBAS	5	
	Total Phosphorus	2	
	Oil and Grease[3]	5 mg/L	
	Total Recoverable Hydrocarbons	5 mg/L	
	Chromium	0.06	
	Copper	1	
	Zinc	5	

Note 1: In-field non-NATA accredited analysis permitted
Note 2: Where laboratory analysis reports a result <LOR, and the <LOR is greater than the corresponding numeric limit, this is a compliant result.
Note 3: to be sampled with USEPA method 5520B

Monitoring

General monitoring

21. The licence holder must ensure that:

(a) all water samples are collected and preserved in accordance with AS/NZS 5667.1;

(b) all water samples for PFAS analysis are to be collected and preserved in accordance with the PFAS NEMP.

(c) all wastewater sampling is conducted in accordance with AS/NZS 5667.10;

(d) all surface water sampling is conducted in accordance with AS/NZS 5667.4, AS/NZS 5667.6 and AS/NZS 5667.9, as relevant;

(e) all groundwater sampling is conducted in accordance with AS/NZS 5667.11;

(f) laboratory sample must be analysed using the appropriate limit of reporting as to allow comparison with relevant environmental guidelines;

(g) all sample analysis must be undertaken by laboratories with current NATA accreditation for the relevant parameters, unless otherwise specified in this Licence.

22. The licence holder must ensure that:

(a) monthly monitoring is undertaken at least 15 days apart; and

(b) six monthly monitoring is undertaken at least five months apart.

Process Monitoring

23. The licence holder must record the total amount of waste accepted onto the premises, and processed on the premises, for each waste type listed in Table 11 in the corresponding unit, and for each corresponding time period, as set out in Table 11.

Table 11: Waste accepted onto the premises

Liquid waste type	Waste code	Unit	Time period
PFAS contaminated waters	M270	kL	Each load arriving at the Arundel PTU

24. The licence holder must undertake the monitoring in Table 12 according to the specifications in that table.

Table 12: Wastewater sampling requirements

Monitoring point reference	Parameter	Unit	Frequency	Averaging period	Method
Orion wastewater sump No. 3 as shown in Figure 7 of Schedule 1	pH[1]	N/A	Monthly	Spot sample	As per condition 21
	Total Dissolved Solids; Total Suspended Solids; Surfactants as MBAS; Total phosphorus; and Oil and Grease[2].	mg/L			
	21 PFAS compounds as listed in Table 10	µg/L			
	Chromium; Copper; and Zinc	mg/L	Six Monthly		
Arundel wastewater sump No. 4 as shown in Figure 8 of Schedule 1	pH[1]	N/A	Monthly		
	Total Dissolved Solids; Total Suspended Solids; Surfactants as MBAS; Total phosphorus; and Oil and Grease[2].	mg/L			
	21 PFAS compounds as listed in Table 10	µg/L			

Monitoring point reference	Parameter	Unit	Frequency	Averaging period	Method
Arundel wastewater sump No. 4 as shown in Figure 8 of Schedule 1	Chromium; Copper; and Zinc	mg/L	Six monthly		
APTD-001 and APTD-002	21 PFAS compounds as listed in Table 10	µg/L	Monthly	Spot sample	As per condition 21

Note 1: In-field non-NATA accredited analysis permitted
Note: 2 to be sampled with USEPA method 5520B

Monitoring of point source emissions to surface water and land

25. The licence holder must undertake the monitoring in Table 13 and Table 14 according to the specifications in those tables.

Table 13: Monitoring of point source emissions to surface water

Monitoring point reference, as shown in Figure 8 of Schedule 1	Process description	Parameter	Unit	Frequency	Averaging period	Method
Arundel Treated Water Ponds 1, 2 and 3 sample points	Discharge from PTU to Treated water ponds 1, 2 and 3 to McKnoes Brook	Cumulative volume	m^3 and tonnes	Continuous	Daily	-
		pH[1]	-	Prior to any discharge from Treated Water ponds 1, 2 or 3 to Mcknoes Brook	Spot sample	As per condition 21
		Total Dissolved Solids	mg/L			
		Total Suspended Solids				
		Chloride				
		Nitrate				
		Magnesium				
		Sodium				
		Sulfate				
		Surfactants as MBAS				
		Total Nitrogen				
		Total Phosphorus				
		Oil and Grease[2]				
		TRH				
		BTEX				
		PAH				
		Aluminium				
		Arsenic				
		Barium				
		Cadmium				
		Chromium				
		Cobalt				
		Copper				
		Lead				
		Manganese				
		Mercury				
		Molybdenum				
		Nickel				
		Zinc				
		21 PFAS compounds as listed in Table 10	µg/L			

Note 1: In-field non-NATA accredited analysis permitted.
Note 2: to be sampled with USEPA method 5520B

Table 14: Monitoring of point source emissions to land

Monitoring point reference, as shown in Figure 8 of Schedule 1	Process description	Parameter	Unit	Frequency	Averaging period	Method
Larego DAF Treated Storage Ponds 1, 2 and 3	Discharge from Larego DAF Treated Water Ponds 1, 2 and 3 to Flinders C Sump and Larego Water Storage Reservoir	Cumulative volume	m^3 and tonnes	Continuous	Monthly	-
		pH[1]	-	Prior to each discharge of wastewater unless there has been no addition of treated wastewater to the sumps since the last sampling event[2]	Spot sample	As per condition 21
		Total Dissolved Solids	mg/L			
		Total Suspended Solids				
		Chloride				
		Nitrate				
		Magnesium				
		Sodium				
		Sulfate				
		Surfactants as MBAS				
		Total Nitrogen				
		Total Phosphorus				
		Oil and Grease[4]				
		TRH				
		BTEX				
		PAH				
		Aluminium		Six monthly[3]		
		Arsenic				
		Barium				
		Cadmium				
		Chromium				
		Cobalt				
		Copper				
		Lead				
		Manganese				
		Mercury				
		Molybdenum				
		Nickel				
		Zinc				

Note 1: In-field non-NATA accredited analysis permitted.

Note 2: Sampling exempt if there is insufficient water to sample

Note 3: sampling exempt if discharge does not occur at least six monthly

Note 4: to be sampled with USEPA method 5520B

Native vegetation monitoring

26. The licence holder shall perform an annual native vegetation health assessment of riparian and riparian adjacent vegetation along McKnoes Brook in accordance with the specifications in Table 15.

Table 15: Annual Vegetation Health Assessment

Health Assessment Parameter	Frequency	Response threshold
Assessment of vegetation health along four transects as shown in Figure 14 of Schedule 1	Once per year, during spring	Assessment to determine statistically detectable change in either: • Mean tree species stem counts within transects • Proportions of health category ratings of mean tree stem counts within transects • Obvious signs of erosion • Comparison of results between upstream transects and downstream transects

27. Should the Annual Vegetation Health Assessment required under condition 26 determine a statistically detectable change in any of the Response Thresholds described in Table 15, the licence holder shall engage a waterway health expert to consider potential sources of loss of health within 60 days of becoming aware of the change. The Licence Holder shall also review the PTU discharge regime and provide to the CEO a plan outlining the proposed changes to reduce further impacts to McKnoes Brook vegetation from the PTU discharge.

Ambient water quality monitoring

28. The licence holder must undertake the monitoring in Table 16 and Table 17 according to the specifications in those tables.

Table 16: Monitoring of ambient surface water quality

Monitoring point reference	Parameter	Unit	Averaging period	Frequency
McKnoes Brook Surface water sampling locations: - Discharge - T2 - T3 - T4 as shown in Figure 6 of Schedule 1	pH[1]	-	Spot sample	Quarterly
	Redox potential (Eh)	mV		
	Electrical conductivity	µS/cm		
	Turbidity	NTU		
	Dissolved oxygen			
	Total Dissolved Solids	mg/L		
	Total Suspended Solids			
	Chloride			
	Nitrate			
	Magnesium			
	Sodium			
	Sulfate			

Monitoring point reference	Parameter	Unit	Averaging period	Frequency
McKnoes Brook Surface water sampling locations: - Discharge - T2 - T3 - T4 as shown in Figure 6 of Schedule 1	Surfactants as MBAS	mg/L	Spot sample	Quarterly
	Total Nitrogen			
	Total Phosphorus			
	TRH			
	BTEX			
	PAH			
	Aluminium			
	Arsenic			
	Barium			
	Cadmium			
	Chromium			
	Cobalt			
	Copper			
	Lead			
	Manganese			
	Mercury			
	Molybdenum			
	Nickel			
	Zinc			
	21 PFAS compounds as listed in Table 10	µg/L		
McKnoes Brook water level monitoring device.	Water level, to allow calculation of daily streamflows at the McKnoes brook Discharge Point	Depth (m)	Daily	Continuous

Note 1: In-field non-NATA accredited analysis permitted.

Table 17: Monitoring of ambient groundwater quality

Monitoring point reference, as shown in Figure 6 of Schedule 1	Parameter	Unit	Averaging period	Frequency
Monitoring bores: BH01 BH04 BH05 BH07 BH08 BH10 BH11	Standing water level	m (AHD) and mbgl	Spot sample	Monthly
	pH[1]	-		
	Total Dissolved Solids	mg/L		
	Chloride			
	Nitrate			
	Magnesium			
	Sodium			
	Sulfate			
	Total Recoverable Hydrocarbons			
	BTEX			
	Aluminium			
	Arsenic			
	Barium			
	Cadmium			
	Chromium			
	Cobalt			
	Copper			
	Lead			
	Manganese			
	Mercury			
	Molybdenum			
	Nickel			
	Zinc			
	21 PFAS compounds as listed in Table 10	µg/L		

Note 1: In-field non-NATA accredited analysis permitted.

29. The licence holder must record the results of all monitoring activity required under this licence.

Records and reporting

30. The licence holder must, within 7 days of becoming aware of any non-compliance with conditions 10, 18, 19 and 20 of this licence, notify the CEO in writing of that non-compliance and include in that notification the following information:

(a) which condition was not complied with;

(b) the time and date when the non-compliance occurred;

(c) if any environmental impact occurred as a result of the non-compliance and if so what that impact is and where the impact occurred;

(d) the details and result of any investigation undertaken into the cause of the non-compliance;

(e) what action has been taken and the date on which it was taken to prevent the non-compliance occurring again; and

(f) what action will be taken and the date by which it will be taken to prevent the non-compliance occurring again.

31. The licence holder must record the following information in relation to complaints received by the licence holder (whether received directly from a complainant or forwarded to them by the Department or another party) about any alleged emissions from the premises:

(a) the name and contact details of the complainant, (if provided);

(b) the time and date of the complaint;

(c) the complete details of the complaint and any other concerns or other issues raised; and

(d) the complete details and dates of any action taken by the licence holder to investigate or respond to any complaint.

32. The licence holder must:

(a) undertake an audit of their compliance with the conditions of this licence during the preceding annual period; and

(b) prepare and submit to the CEO by no later than 31 of March each year, an Annual Audit Compliance Report for the previous annual period in the approved form.

33. The licence holder must submit to the CEO by no later than 31 March each year, an Annual Environmental Report for previous annual period for the conditions listed in Table 18, and which provides information in accordance with the corresponding requirement set out in Table 18.

Table 18: Annual Environmental Report

Condition	Requirement
-	A summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period, including any actions taken.

10, 11 and 23	• A summary of the waste acceptance, treatment and removal at the premises (including volumes, waste types and disposal locations) presented in table format; and
	• A summary of wastewater volumes treated and discharged including
	  ○ breakdown of volumes generated each from Orion and Arundel mining areas
	  ○ an assessment of reliability of field procedures and laboratory results

Condition	Requirement
12 and 13	A summary of inspections and maintenance performed to address the operational requirements in Table 6 and Table 7 during the annual period.
19, 20 and 25,	• Tabulated monitoring data results and time-series graphs showing concentrations of all parameters over a minimum three-year period (where sufficient data allows) and compares discharge concentrations against any limits imposed under condition 20; • An assessment and interpretation of the data, including comparison to historical trends and compliance with any discharge limits imposed; and • an assessment of reliability of field procedures and laboratory results • Volume of water discharge to McKnoes Brook with a comparison against discharge rate limits.
23 and 24	Process monitoring data
26	A summary of results from the Annual Health Vegetation Assessment
28	• A tabulated summary of results from ambient ground water and surface water monitoring, as well as all raw data provided in an accompanying Microsoft Excel spreadsheet digital document/file (or a compatible equivalent digital document/file), with all results being clearly referenced to laboratory certificates of analysis; • Water level monitoring data and calculation of daily streamflows at the McKnoes brook Discharge Point. • a diagram with aerial image overlay showing all monitoring locations and depicting groundwater level contours and flow direction (relevant site features including discharge points and other potential sources of emissions must also be shown); • an interpretive summary and assessment of the results against relevant assessment levels for surface water and groundwater, as published in the Guideline Assessment and Management of Contaminated Sites and the PFAS National Environment Management Plan (as amended from time to time); • an interpretive summary and assessment of results against previous monitoring results over a minimum three-year period (where sufficient data allows); and • trend graphs to provide a graphical representation of historical results and to support the interpretive summary.
30	Summary of non-compliances with conditions 10, 18, 19 and 20 of the licence
31	A summary of complaints received, and any action taken to investigate or respond to any complaint.
32	Annual Audit Compliance Report

Note 1: General guidance on report presentation can be found in the Department's *Guideline: Assessment and management of contaminated sites*.

34. The licence holder must maintain accurate and auditable books including the following records, information, reports, and data required by this licence:

(a) the calculation of fees payable in respect of this licence;

(b) the works conducted in accordance with condition 1 of this licence;

(c) any maintenance of infrastructure that is performed in the course of complying with condition 12 of this licence;

(d) monitoring programmes undertaken in accordance with conditions 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, and 28 and of this licence; and

(e) complaints received under condition 31 of this licence.

35. The books specified under condition 34 must:

(a) be legible;

(b) if amended, be amended in such a way that the original version(s) and any subsequent amendments remain legible and are capable of retrieval;

(c) be retained by the licence holder for the duration of the licence; and

(d) be available to be produced to an inspector or the CEO as required.

Definitions

In this licence, the terms in Table 19 have the meanings defined.

Table 19: Definitions

Term	Definition
ACN	Australian Company Number
AEP	Annual exceedance probability
Annual Audit Compliance Report (AACR)	means a report submitted in a format approved by the CEO (relevant guidelines and templates may be available on the Department's website).
annual period	a 12 month period commencing from 1 January until 31 December in each year
APTD-001 and APTD-002	means Arundel Pre-treatment dam 001 and Arundel Pre-treatment dam 002 as shown in Figure 2 and Figure 8
Arundel mining area infrastructure	means the overland ore conveyor 371 (CV371), the Arundel 371/374 Transfer Station, the PTU and all other fixed plant located at the Arundel site depicted in Figure 1
Assessment of Site Contamination NEPM	means the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended from time to time;
Guideline: Assessment and management of contaminated sites	means the document titled Assessment and management of contaminated sites, Contaminated sites guidelines (Department of Environment Regulation, December 2014), as amended from time to time
books	has the same meaning given to that term under the EP Act.
BTEX	Means Benzene, Toluene, Ethylbenzene, m&p-Xylene, o-Xylene and Total-Xylene
CEO	means Chief Executive Officer of the Department. "submit to / notify the CEO" (or similar), means either: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 or: info@dwer.wa.gov.au
condition	a condition to which this licence is subject under section 62 of the EP Act.
Controlled Waste Regulations	*Environmental Protection (Controlled Waste) Regulations 2004* (WA).

Term	Definition
dampened	means moist to the touch
Department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
discharge	has the same meaning given to that term under the EP Act.
emission	has the same meaning given to that term under the EP Act.
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
Guideline: Assessment and management of contaminated sites	means the document titled *Assessment and management of contaminated sites* (Contaminated sites guidelines) (Department of Environment Regulation, December 2014).
licence	refers to this document, which evidences the grant of a licence by the CEO under section 57 of the EP Act, subject to the specified conditions contained within.
Landfill Definitions	*Landfill Waste Classification and Waste Definitions 1996* (as amended from time to time)
licence holder	refers to the occupier of the premises, being the person specified on the front of the licence as the person to whom this licence has been granted.
LOR	means Limit of Reporting
m(AHD)	means metres in Australian Height Datum
mbgl	means metres below ground level
Orion mining area	Means the
PAH	means Polycyclic Aromatic Hydrocarbons
PFAS	means per-and polyfluoroalkyl substances
PFAS NEMP	Heads of EPA Australia and New Zealand 2020, *PFAS National Environmental Management Plan Version 2.0*
premises	refers to the premises to which this licence applies, as specified at the front of this licence and as shown on the premises maps (Figures 1 – 9) in Schedule 1 to this licence and defined by the coordinates listed in Schedule 2 to this licence.
prescribed premises	has the same meaning given to that term under the EP Act.
PTU	means PFAS water treatment unit as shown in Figure 2 and Figure 3

Term	Definition
suitably qualified civil engineer	means a person who holds a tertiary academic qualification in engineering and has a minimum of three years of experience working in the area of civil/construction engineering
TRH	means Total Recoverable Hydrocarbons
waste	has the same meaning given to that term under the EP Act.
waste type	waste types identified in the Landfill Definitions, or in Schedule 1 of the Controlled Waste Regulations (as applicable).

END OF CONDITIONS

Schedule 1: Maps

Premises map

The boundary of the prescribed premises is shown in the map below (Figure 1).

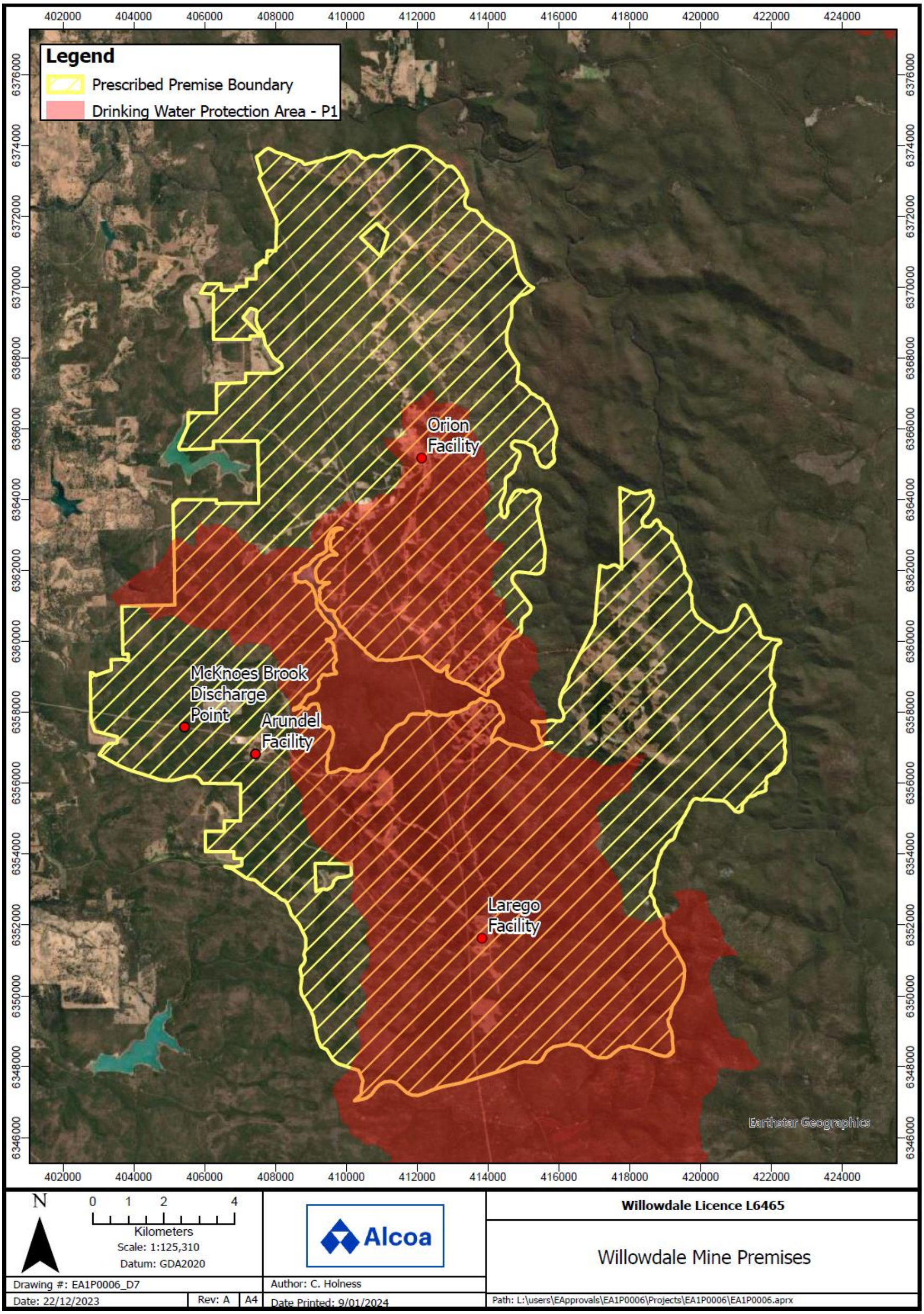


Figure 1: Map of the boundary of the prescribed premises

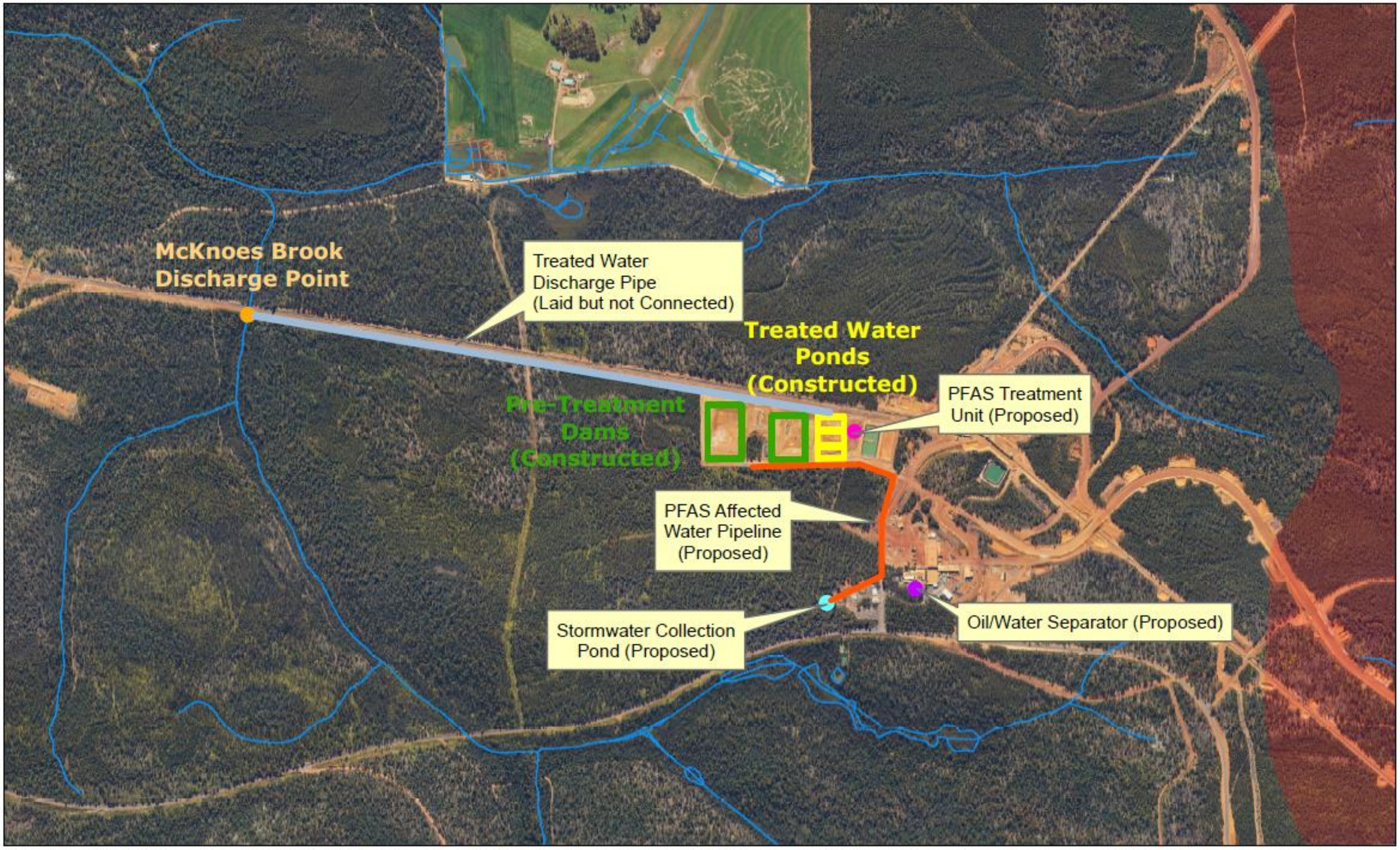


Figure 2: Layout of Arundel PFAS water treatment system and discharge point to McKnoes Brook

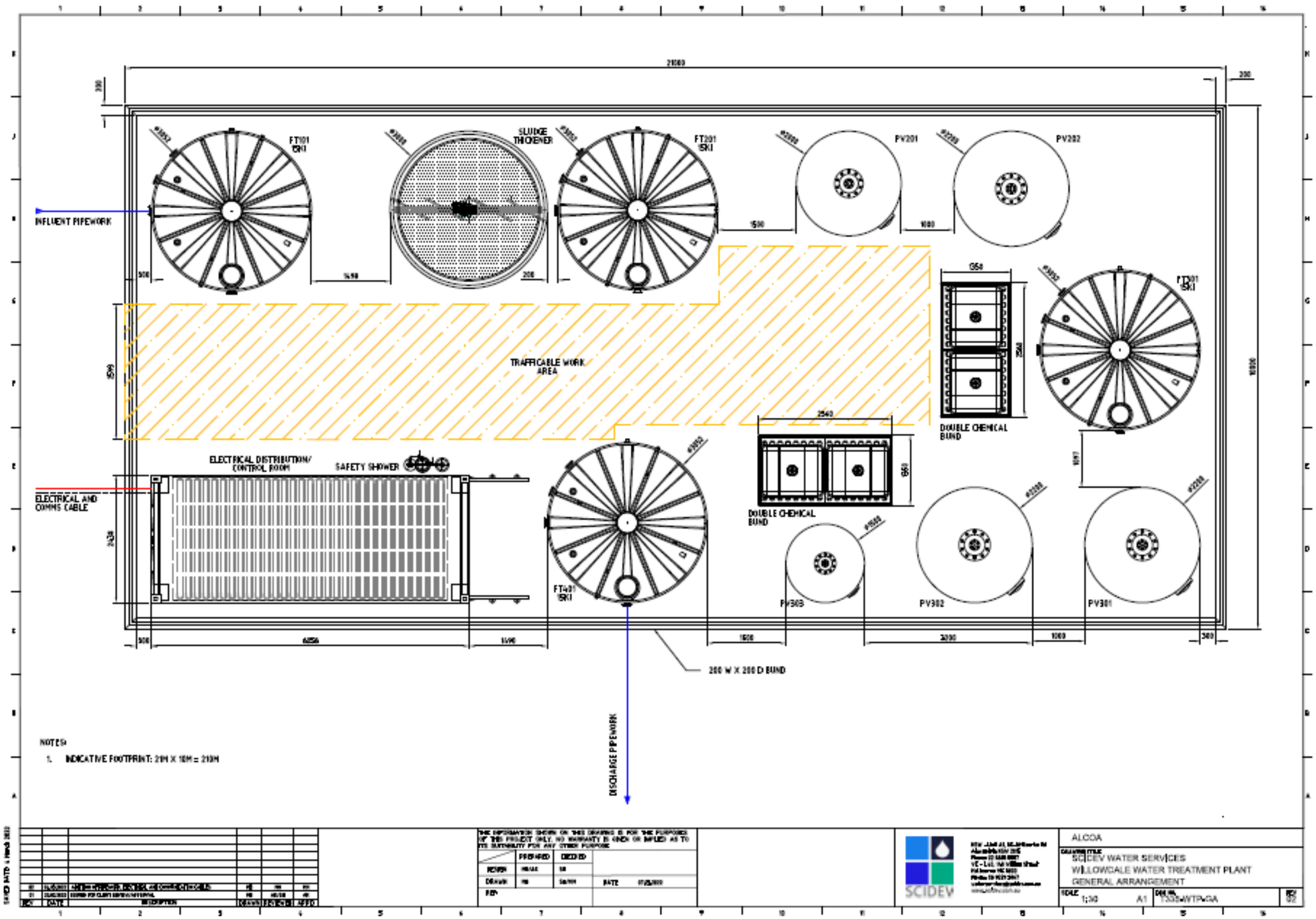


Figure 3: PFAS Treatment Unit layout drawing

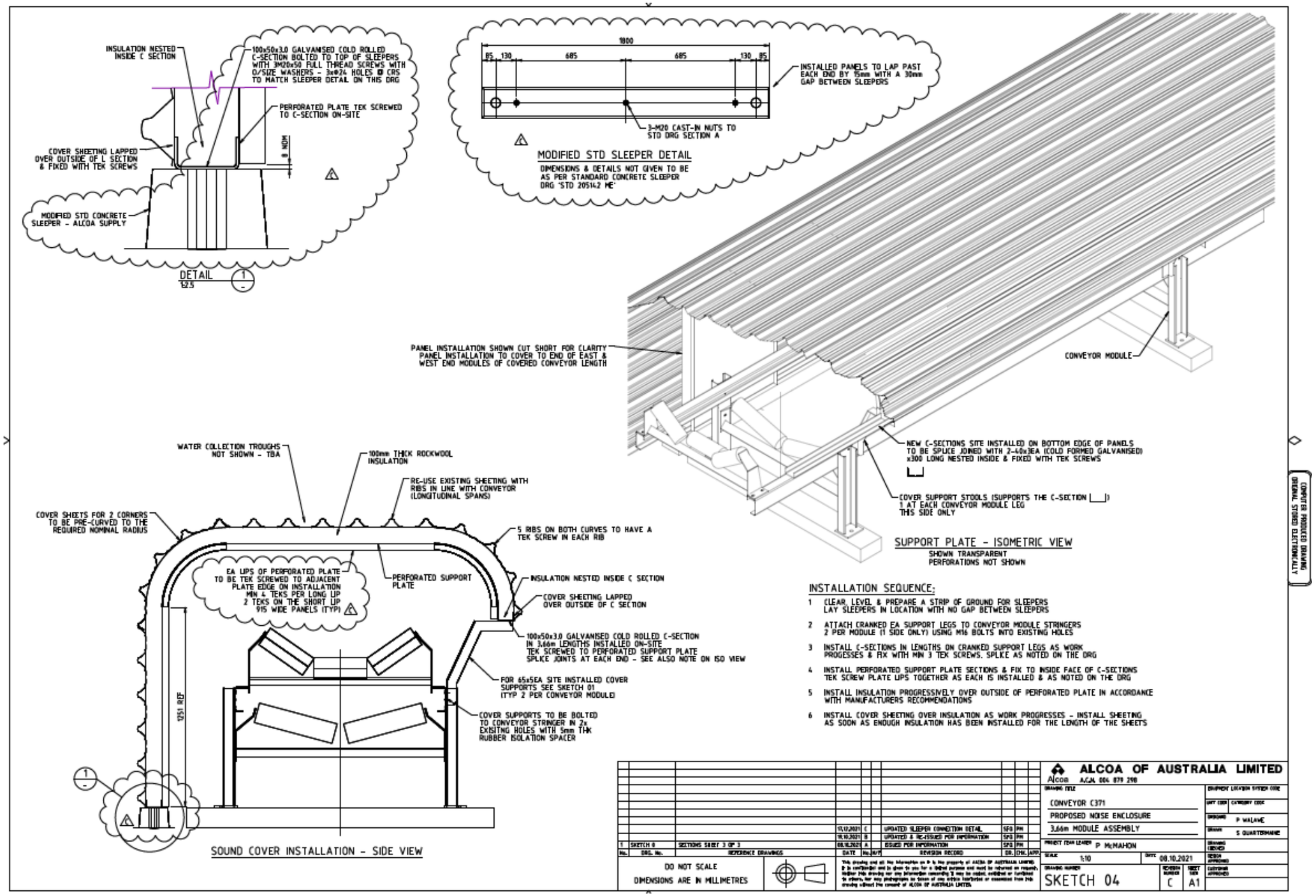


Figure 4: Conveyor 371 Noise enclosure

Figure 5: Willowdale mine ore conveyor infrastructure and nearest noise sensitive premises (R1)

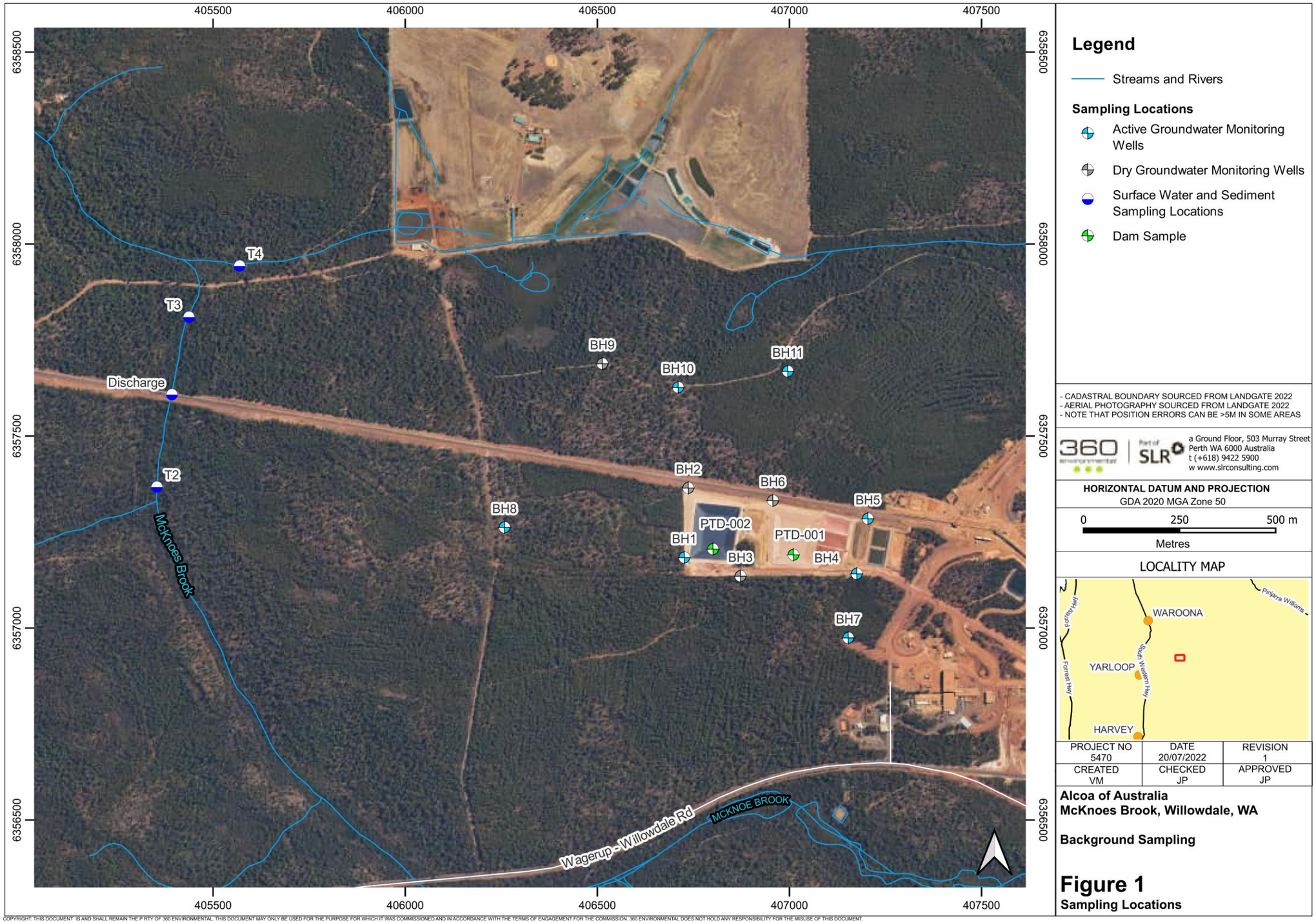
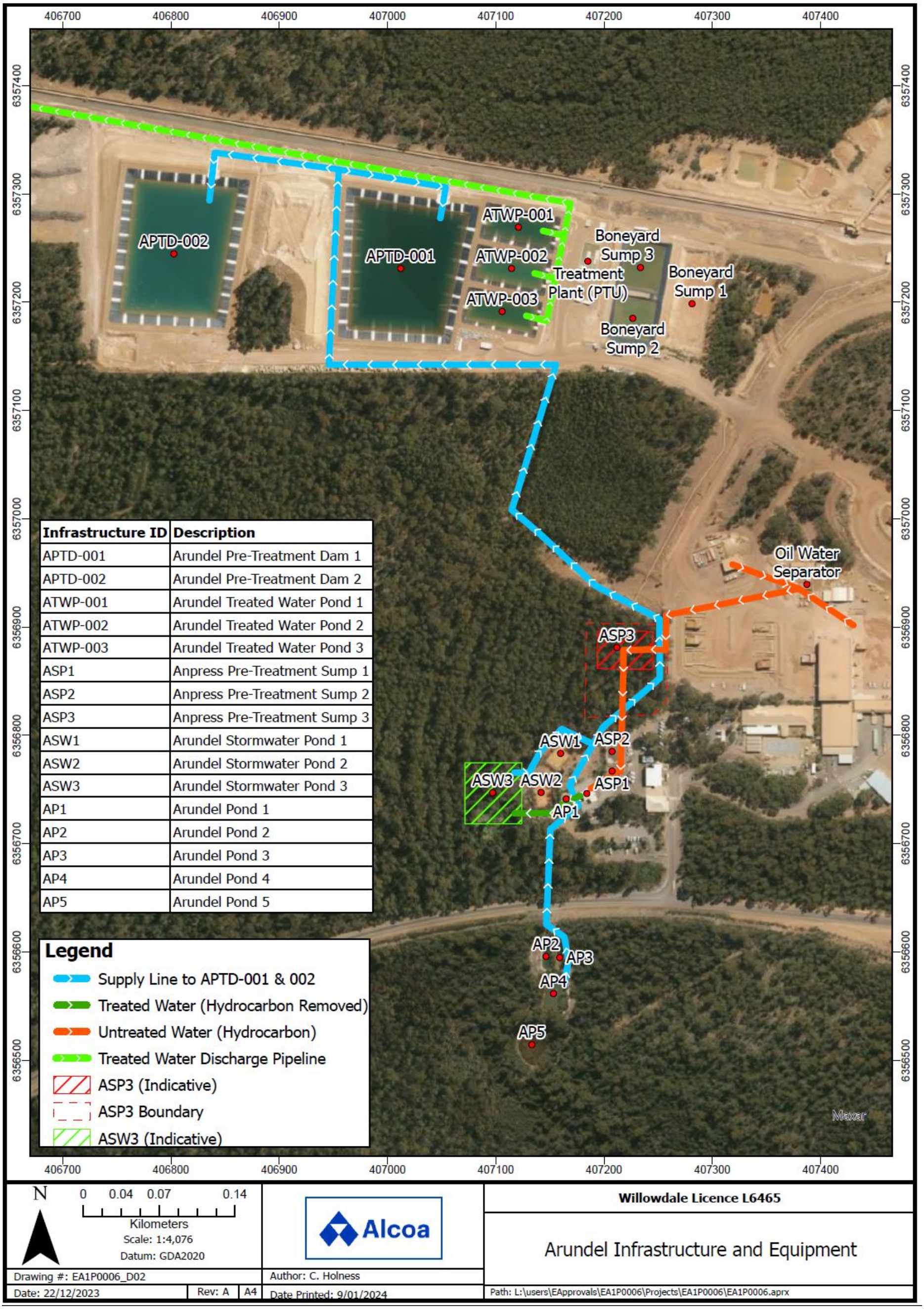


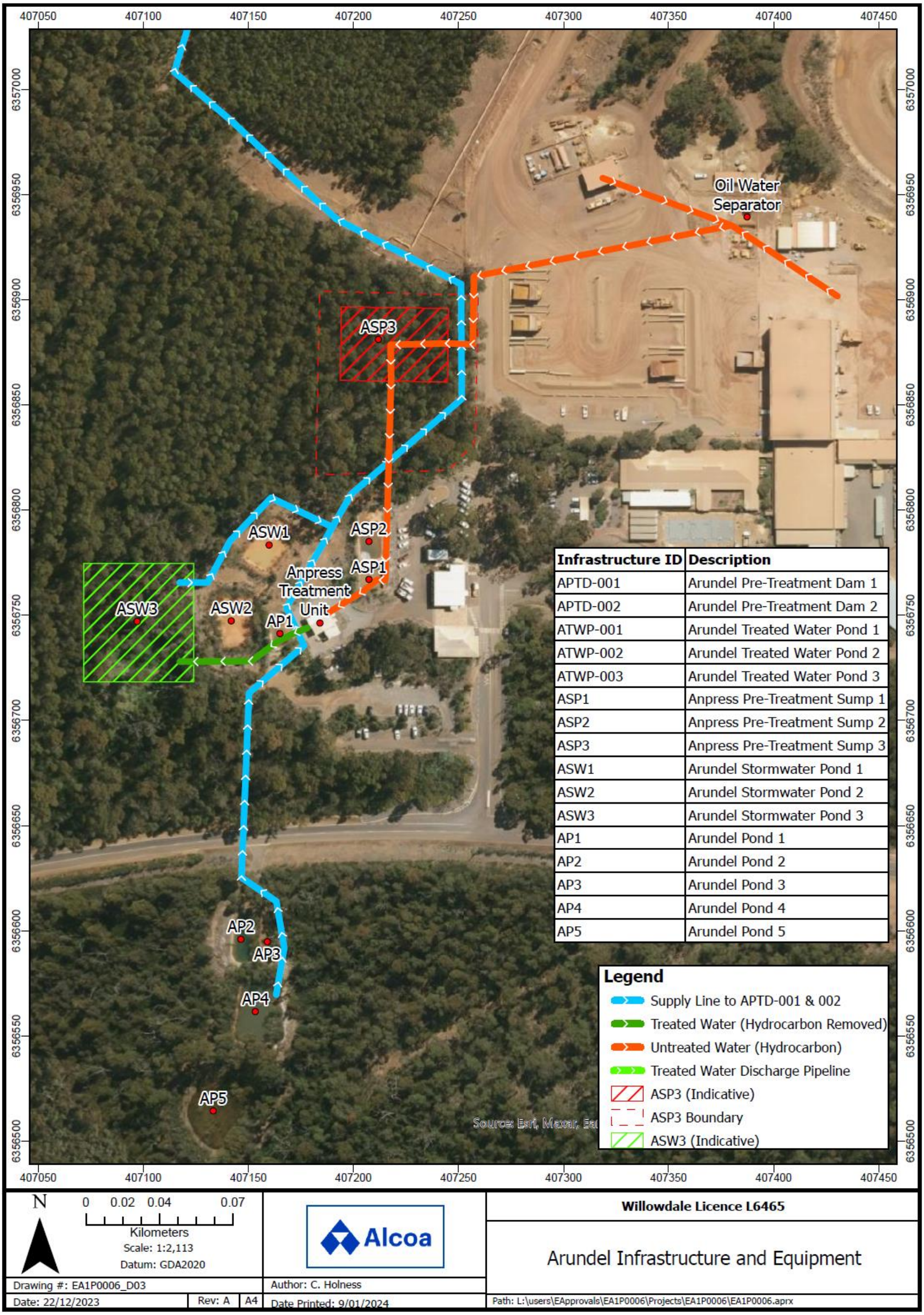
Figure 6: Surface water sampling locations within McKnoes Brook and groundwater monitoring bore locations around the PTU

Figure 7: Orion site layout and drainage plan



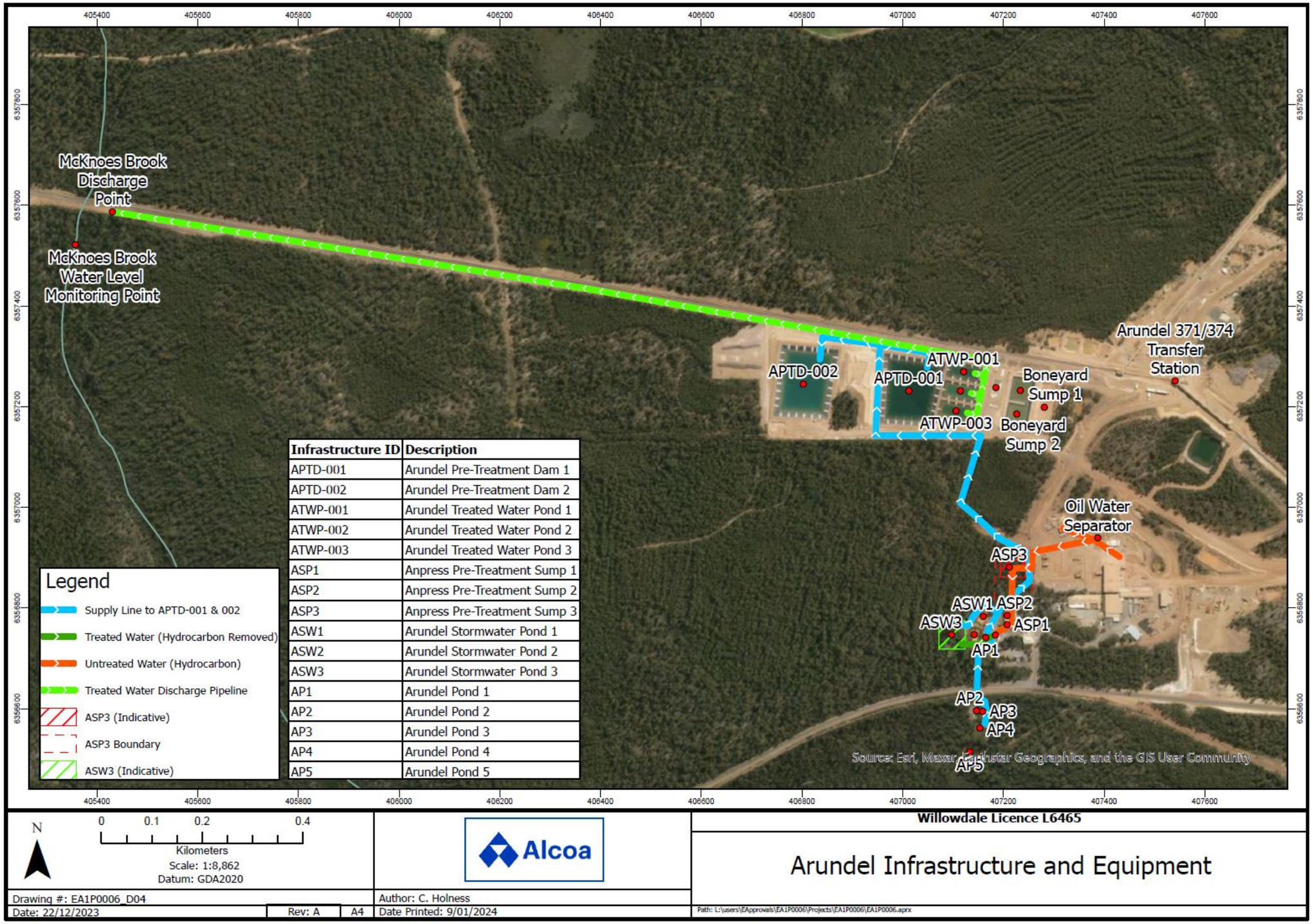
Infrastructure ID	Description
APTD-001	Arundel Pre-Treatment Dam 1
APTD-002	Arundel Pre-Treatment Dam 2
ATWP-001	Arundel Treated Water Pond 1
ATWP-002	Arundel Treated Water Pond 2
ATWP-003	Arundel Treated Water Pond 3
ASP1	Anpress Pre-Treatment Sump 1
ASP2	Anpress Pre-Treatment Sump 2
ASP3	Anpress Pre-Treatment Sump 3
ASW1	Arundel Stormwater Pond 1
ASW2	Arundel Stormwater Pond 2
ASW3	Arundel Stormwater Pond 3
AP1	Arundel Pond 1
AP2	Arundel Pond 2
AP3	Arundel Pond 3
AP4	Arundel Pond 4
AP5	Arundel Pond 5

Figure 8: Arundel site layout and drainage plan



Infrastructure ID	Description
APTD-001	Arundel Pre-Treatment Dam 1
APTD-002	Arundel Pre-Treatment Dam 2
ATWP-001	Arundel Treated Water Pond 1
ATWP-002	Arundel Treated Water Pond 2
ATWP-003	Arundel Treated Water Pond 3
ASP1	Anpress Pre-Treatment Sump 1
ASP2	Anpress Pre-Treatment Sump 2
ASP3	Anpress Pre-Treatment Sump 3
ASW1	Arundel Stormwater Pond 1
ASW2	Arundel Stormwater Pond 2
ASW3	Arundel Stormwater Pond 3
AP1	Arundel Pond 1
AP2	Arundel Pond 2
AP3	Arundel Pond 3
AP4	Arundel Pond 4
AP5	Arundel Pond 5

Figure 9: Arundel infrastructure and equipment



Infrastructure ID	Description
APTD-001	Arundel Pre-Treatment Dam 1
APTD-002	Arundel Pre-Treatment Dam 2
ATWP-001	Arundel Treated Water Pond 1
ATWP-002	Arundel Treated Water Pond 2
ATWP-003	Arundel Treated Water Pond 3
ASP1	Anpress Pre-Treatment Sump 1
ASP2	Anpress Pre-Treatment Sump 2
ASP3	Anpress Pre-Treatment Sump 3
ASW1	Arundel Stormwater Pond 1
ASW2	Arundel Stormwater Pond 2
ASW3	Arundel Stormwater Pond 3
AP1	Arundel Pond 1
AP2	Arundel Pond 2
AP3	Arundel Pond 3
AP4	Arundel Pond 4
AP5	Arundel Pond 5

Figure 10: Arundel Infrastructure and Equipment continued

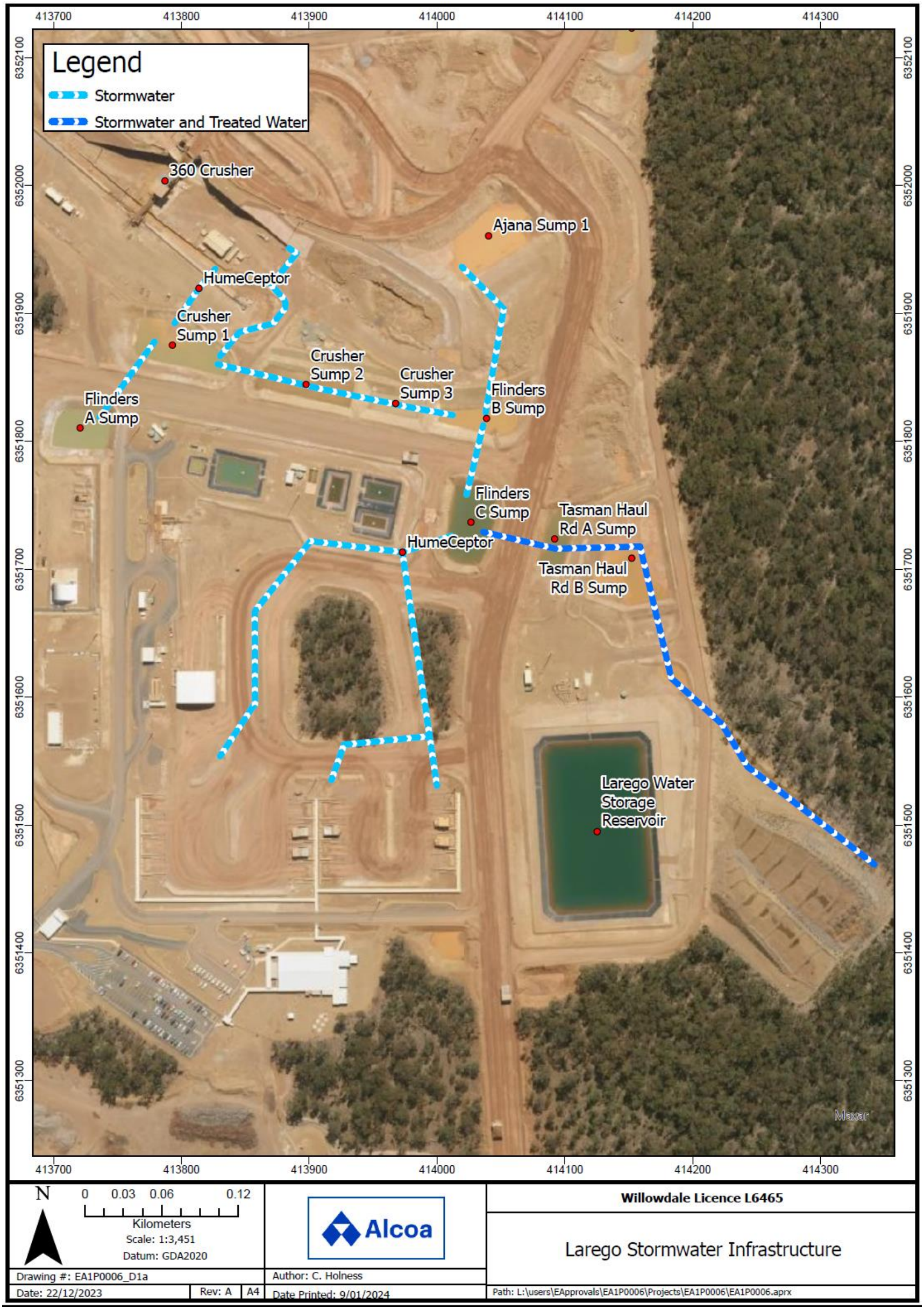


Figure 11: Larego site layout and stormwater infrastructure

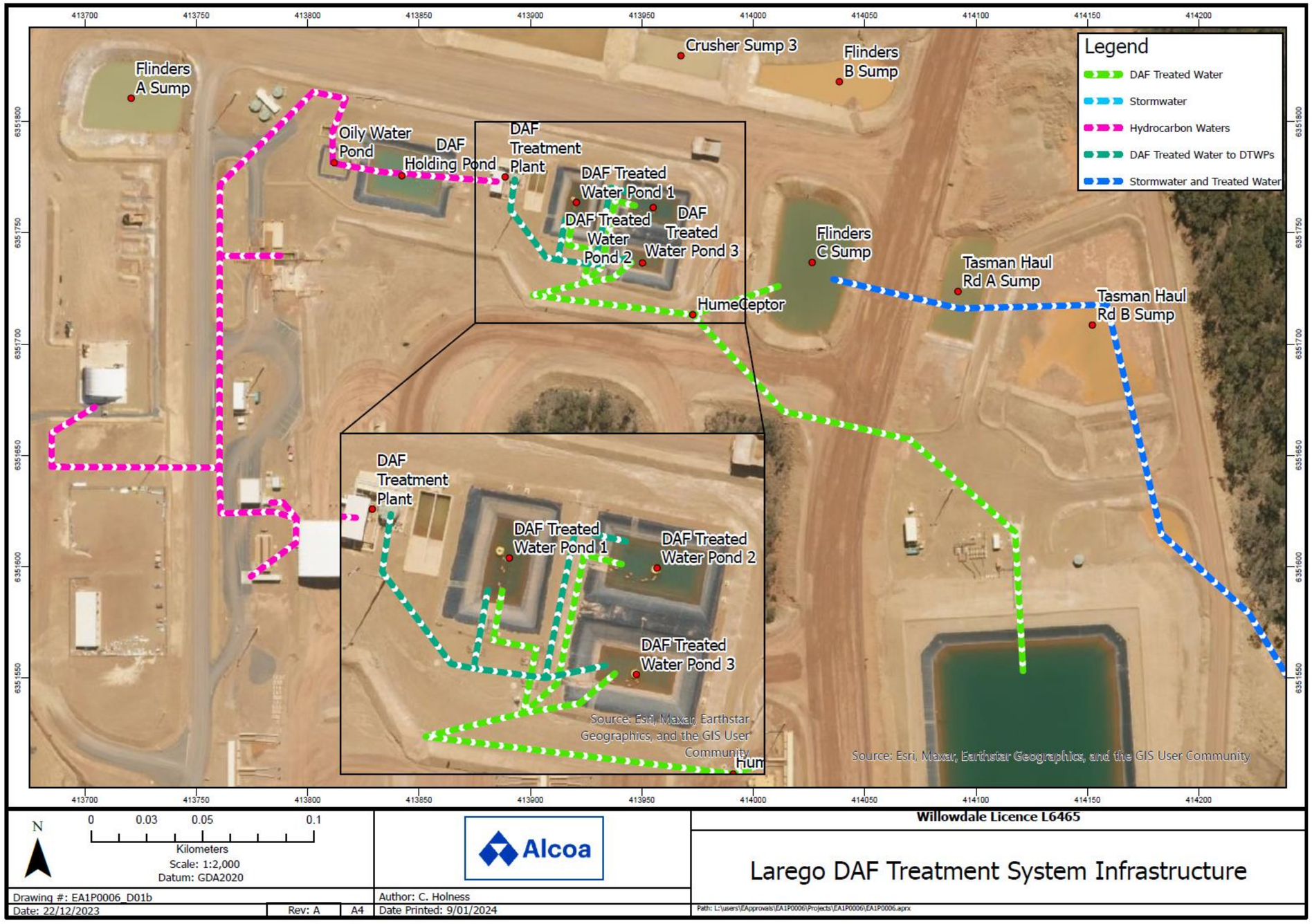


Figure 12: DAF Treatment system infrastructure

Figure 13: Anpress Treatment System Layout

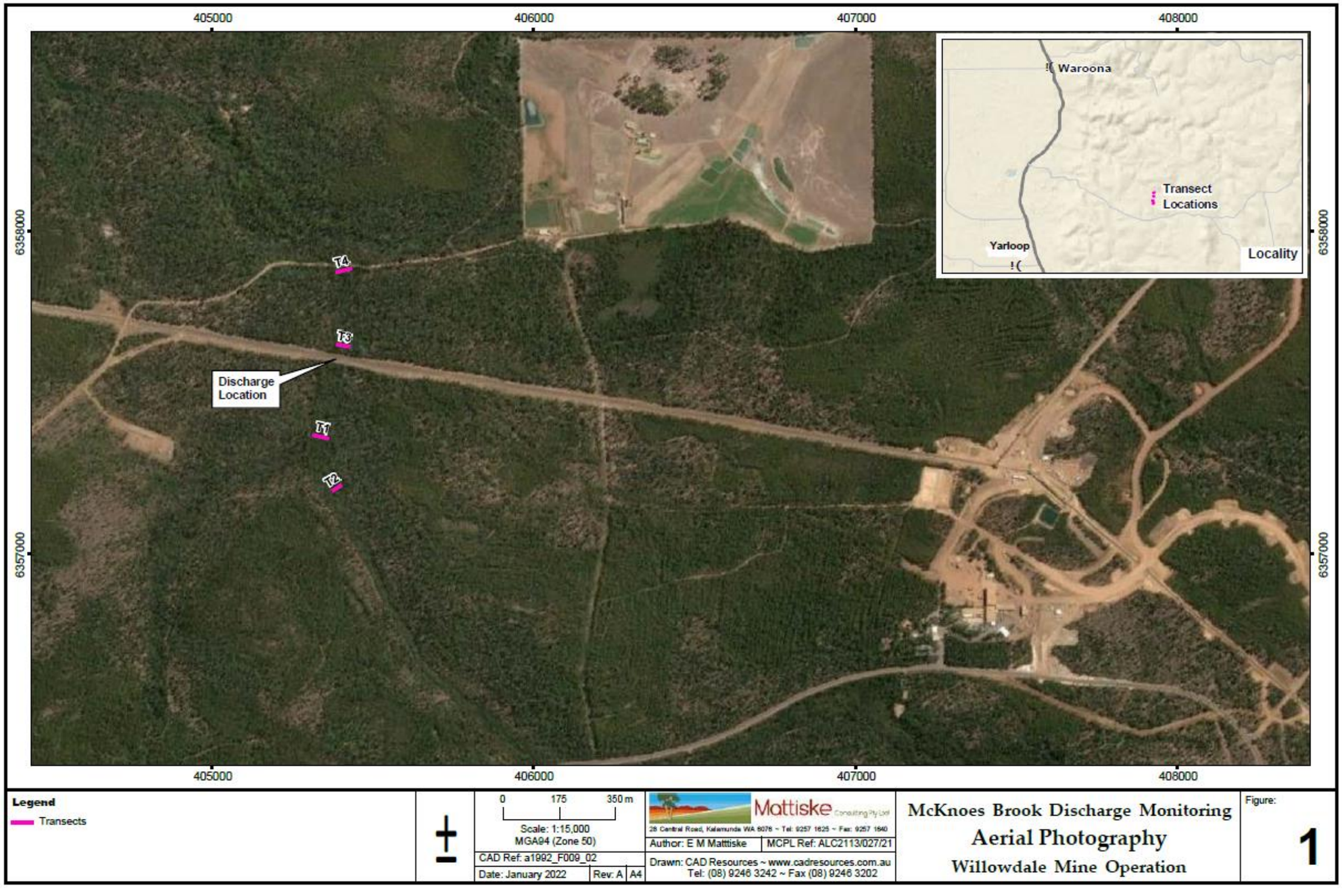


Figure 14: McKnoes Brook Baseline Flora and Vegetation Transect locations