Government of Western Australia
Department of Water and Environmental Regulation

Revised Works Approval

Works approval number	W6499/2021/1
Works approval holder	Covalent Lithium Pty Ltd
ACN	70 623 090 139
Registered business address	Level 17 109 St Georges Terrace PERTH WA 6000
DWER file number	DER2020/000568
Duration	31/08/2021 to 30/08/2026
Date of issue	31/08/2021
Date of last amendment	8 April 2025
Premises details	Covalent Lithium Hydroxide Refinery 15 Mason Road KWINANA WA 6167 Legal description – Lot 15 on Diagram 74883 As defined in Schedule 1 Premises Map

Prescribed premises category description (Schedule 1, Environmental Protection Regulations 1987)	Assessed production capacity
Category 31: Chemical manufacturing: premises (other than premises with category 32) on which chemical products are manufactured by a chemical process.	50,276 dry tpa lithium hydroxide 116,531 dry tpa sodium sulphate
Category 44: Metal smelting or refining: premises on which metal ore concentrate, or metal waste is smelted, fused, roasted, refined or processed.	382,860 dry tpa of spodumene ore

This works approval is granted to the works approval holder, subject to the attached conditions, on 8 April 2025, by:

Alana Kidd

Digitally signed by Alana Kidd
Date: 2025.04.08 09:12:38 +08'00'

Alana Kidd
Manager, Green Energy
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Works approval history

Date	Ref number	Summary of changes
31/08/2021	W6499/2021/1	Works approval granted.
23/02/2022	W6499/2021/1	Amendment to monitoring well construction method.
09/05/2022	W6499/2021/1	Amendment to groundwater monitoring parameters and monitoring well construction period.
13/03/2024	W6499/2021/1	Works approval holder-initiated amendment to update Tables 5, 9 and 11, allow multiple Environmental Commissioning Reports and update figure references.
8/04/2025	W6499/2021/1	Works approval holder-initiated amendment to update Table 10 for changes to frequency and sampling methods for air sampling events.

Interpretation

In this works approval:

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

Works approval conditions

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

Construction phase

Infrastructure and equipment

1. The works approval holder must:

(a) construct and/or install the infrastructure and/or equipment;
(b) in accordance with the corresponding design and construction / installation requirements; and
(c) at the corresponding infrastructure location; and

as set out in Schedule 2 Table 9.

Compliance reporting

2. The works approval holder within 30 calendar days of any items of infrastructure or

equipment required by condition 1 being constructed and/or installed:

(a) undertake an audit of their compliance with the requirements of condition 1; and
(b) prepare and submit to the CEO an Environmental Compliance Report on that compliance.

3. The Environmental Compliance Report's required by condition 2, must include as a minimum the following:

(a) certification by an engineer that the infrastructure or components thereof, as specified in condition 1 for items 4, 5 and 6, 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 condition1;
(c) a groundwater monitoring bore construction report evidencing compliance with condition 7;
(d) be signed by a person authorised to represent the works approval holder and contains the printed name and position of that person; and
(e) submit all water quality data taken in Condition 8.

Fugitive dust - construction

4. The works approval holder must undertake the minimum requirements specified in Table 1 for the works to minimise the generation of airborne dust from the premises.

Table 1: Fugitive dust management requirements during construction

Dust control	Requirements
Water carts	Operate when visible dust is generated from external ground surface areas on the premises. Operate proactively subject to weather forecasting over a 24 hour period. Operate when visible dust is reported by site personnel.
Dust suppressants	Apply proactively. Re-apply proactively subject to visual inspection and weather forecasting over a 24 hour period.
Vehicles	Defined haul routes for vehicles to traverse unsealed surfaces or unformed roads.

Contaminated site – specified actions

5. The works approval holder must not undertake dewatering of groundwater as part of construction activities on the premises unless a Dewatering Management Plan has been submitted to, and approved by, DWER detailing management measures to mitigate potential vapour emission risk associated with chlorophenol contaminated groundwater.

6. The works approval holder when undertaking any piling activities as part of construction must only use driven piles installed using a dropped weight impact hammer technique.

7. The works approval holder must design, construct, and install groundwater monitoring wells in accordance with the requirements specified in Table 2.

Table 2: Infrastructure requirements – groundwater monitoring wells

Infrastructure	Design, construction, and installation requirements	Monitoring well location	Timeframe
Groundwater monitoring well(s) MW15 and MW16	Well design and construction: Designed and constructed in accordance with *ASTM D5092/D5092M-16: Standard practice for design and installation of groundwater monitoring bores*. The construction technique for the wells must ensure that a good seal is maintained between the Safety Bay Sands aquifer and clayey aquitard to the Tamala Limestone aquifer, such that cross-contamination between the upper and lower aquifers does not occur.	As depicted in Schedule 3, Figure 4: Map of groundwater monitoring well locations and labelled as MW15 and MW16.	Must be constructed, developed (purged), and determined to be operational by no later than 330 calendar days of the date of issue of this works approval.
	<u>Logging of borehole:</u> Soil samples must be collected and logged during the installation of the monitoring wells. A record of the geology encountered during drilling must be described and classified in accordance with the Australian Standard Geotechnical Site Investigations AS1726. Any observations of staining / odours or other indications of contamination must be included in the bore log.		
	<u>Well construction log:</u> Well construction details must be documented within a well construction log to demonstrate compliance with *ASTM D5092/D5092M-16*. The construction logs shall include elevations of the top of casing position to be used as the reference point for water-level measurements, and the elevations of the ground surface protective installations.		
	<u>Well development:</u> All installed monitoring wells must be developed after drilling to remove fine sand, silt, clay and any drilling mud residues from around the well screen to ensure the hydraulic functioning of the well. A detailed record should be kept of well development activities and included in the well construction log.		
	<u>Installation survey:</u> the vertical (top of casing) and horizontal position of each monitoring well must be surveyed and subsequently mapped by a suitably qualified surveyor.		
	<u>Well network map:</u> a well location map (using aerial image overlay) must be		

Infrastructure	Design, construction, and installation requirements	Monitoring well location	Timeframe
	prepared and include the location of all monitoring wells in the monitoring network and their respective identification numbers.		

Note 1: Refer to Section 8 of Schedule B2 of the Assessment of Site Contamination NEPM for guidance on well screen depth and length.

Groundwater monitoring - construction

8. The works approval holder must monitor the groundwater monitoring wells during construction for concentrations of the identified parameters in accordance with Table 3.

Table 3: Monitoring of ambient concentrations during construction

Monitoring Point	Monitoring location	Chemical Suites and Units	Frequency	Averaging period	Sampling method	Analytical Method
Groundwater wells GBH2, GGW02, MW1, MW4A, MW7, MW9, MW10, MW12, MW13, MW15, MW16	As depicted in Schedule 3, Figure 4	*MAH (BTEX) suite (mg/L)	Monthly commencing within 30 days of groundwater bore installation as required by condition 7	Spot sample	AS/NZS 5667.11 and AS/NZS 5667.1	USEPA SW 846 - 8260B
		*Total Recoverable Hydrocarbons (TRH) suite (mg/L)				
		*Metals (dissolved) [As, Cr (III), Cr (VI), F, Fe, Co, Cu, Ni, Li, Sb, Se, U, V, Zn] (mg/L)				SEPA 6010, 6020, APHA 3500-Cr B [Cr(IV) only], or other NATA approved methods
		pH (no unit)^				-
		Electrical conductivity (dS/m)^				
		Redox (Eh)^				

** See Appendix 4, Table 11 for chemical suite units.*

^ In-field, non-NATA accredited analysis permitted.

NB-Alternate analytical methods, including in-house laboratory methods are acceptable, provided alternate methods are comparable with those specified and the laboratory undertaking analysis hold relevant NATA accreditation.

9. The works approval holder must record the results of all monitoring activity required by condition 8.

10. The works approval holder must ensure that all non-continuous sampling and analysis undertaken pursuant to conditions 8, 16 and 26 is undertaken by a holder of a current accreditation from the National Association of Testing Authorities (NATA) for the methods of sampling and/or analysis relevant to the corresponding analytical parameter.

Environmental commissioning phase

Environmental commissioning – infrastructure requirements

11. The works approval holder may only commence environmental commissioning of the infrastructure identified in condition 1 once the Environmental Compliance Report has been submitted for that infrastructure in accordance with condition 3.

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

(a) in accordance with the corresponding commissioning requirements; and
(b) for the corresponding authorised commissioning duration.

Table 4: Environmental commissioning and time limited operational requirements

	Site infrastructure and equipment	Requirements	Authorised duration	Infrastructure location
1	All calciners	Operate with a bag filter system	Environmental Commissioning: For a period not exceeding 90 calendar days in aggregate. Time limited operations: For a period not exceeding 180 calendar days in aggregate.	As shown with Schedule 1, Figure 3, labelled as 2
2	All spodumene mills	Operate with a bag filter system		As shown with Schedule 1, Figure 3, labelled as 2
3	All acid roasters kilns	A system for scrubbing acid vapour process off gas from the acid roast kiln comprise and operate with: • Venturi scrubber. • Combined cyclonic and chevron type entrapment separator. • Quench vessel for cooling. • Wet electrostatic precipitator to capture fine particles. • A fibre bed mist eliminator • Pressurised emergency water vessel.		As shown with Schedule 1, Figure 3, labelled as 2
4	Lithium hydroxide and sodium sulphate storage and packing building and product conveyors.	Must be kept enclosed except for the entry and exit of vehicles and machinery. Spodumene ore concentrate, and DBS kept damp. Spodumene ore and DBS transported in an overhead conveyor with enclosed top and side treatments	Commissioning: For a period not exceeding 360 calendar days in aggregate. Time limited operations: For a period not exceeding 180 calendar days in aggregate.	As shown with Schedule 1, Figure 3, labelled as 6
5	Spodumene ore concentrate, acid roasted solids, reagents and loose by products	Must be stored within dedicated buildings, warehouses, silos, tanks, or vessels. All bunds and compounds shall be maintained so that they can retain the capacity specified and continue to prevent the escape of any contained liquid. Valves, pipes, pumps and sumps shall be maintained so that they are capable of retaining and transferring		As shown with Schedule 1, Figure 3, labelled as 1 and 3.

	Site infrastructure and equipment	Requirements	Authorised duration	Infrastructure location
		contained liquid to prevent escape. Loads must be covered when transported by truck within the premises. Solid materials are kept above extinction levels when storing and transferring within the premises.		
6	Process contaminated stormwater system	Stormwater runoff generated within storage and processing areas perimeter bunds, is directed to the containment tank, WWTP tanks and / or disposal to the SDOOL.	Commissioning: For a period not exceeding 360 calendar days in aggregate. Time limited operations: For a period not exceeding 180 calendar days in aggregate.	As shown with Schedule 1, Figure 3, labelled as 2
7	SDOOL	Flowmeter (F1) is maintained in working condition. Discharge sampling point is maintained for monitoring access (E1).		As shown with Schedule 1, Figure 2, as F1 E1 and 2
8	Groundwater wells	Maintain in operable condition to allow groundwater samples to be taken		As shown with Schedule 1, Figure 4, as GBH2, GGW02, MW1, MW4A, MW7, MW9, MW10, MW12, MW13, MW15, MW16

Environmental commissioning -authorised discharge points for emissions

13. During environmental commissioning, the works approval holder must ensure that the emission(s) specified in Table 5 are discharged only from the corresponding discharge point(s) and only at the corresponding discharge point location(s).

Table 5: Authorised discharge points during environmental commissioning and time limited operation

	Emission	Discharge point	Discharge point height (magl)	Discharge point location	Location coordinates
1.	NO_2, particulate matter, CO, SO_2 ,	Calcination stack Train 1, SK1	46.0	As shown in Schedule 1: Figure 2 as Sk1	384145 E, 6434773 N
2.	NO_2, particulate matter, CO, SO_2,	Calcination stack, Train 2, SK4	45.7	As shown in Schedule 1: Figure 2 as Sk4	384145 E, 6434709 N
3	Particulate matter	Ball mill stack, Train 1, Sk2	25.8	As shown in Schedule 1: Figure 2 as Sk2	384033 E, 6434786 N
4	Particulate	Ball mill stack,	25.8	As shown in	384034 E, 6434722 N

	Emission	Discharge point	Discharge point height (magl)	Discharge point location	Location coordinates
	matter	Train 2, Sk5		Schedule 1: Figure 2 as Sk5	
5	NO_2, particulate matter, CO, SO_2, SO_3	Acid roaster stack, Train 1, Sk3	28.5	As shown in Schedule 1: Figure 2 as Sk3	384111 E, 6434799 N
6	NO_2, particulate matter, CO, SO_2, SO_3	Acid roaster stack, Train 2, Sk6	28.2	As shown in Schedule 1: Figure 2 as Sk6	384111 E, 6434735 N
7	NO_2, CO	Steam boiler stack, Sk8	11.5	As shown in Schedule 1: Figure 2 as Sk8	384293 E, 6434727 N
8	NO_2, CO, particulate matter	Sodium sulphate stack, Sk7	10.2	As shown in Schedule 1: Figure 2 as Sk7	384465 E, 6434709 N
9	SDOOL wastewater	SDOOL E1	-	As shown in Schedule 1: Figure 2 as E1	-

14. During environmental commissioning, the works approval holder must ensure that the emissions from the discharge point listed in Table 6 do not exceed the corresponding limit(s) when monitored in accordance with condition 15.

Table 6: Emission and discharge limits during environmental commissioning and time limited operation

	Discharge point	Parameter	Limit
1	Calcination stack Sk1 Calcination stack Sk4	NO_x	500 mg/m^3 dry at 10% O_2
		TSP	50 mg/m^3
2	Ball mill stack Sk2 Ball mill stack Sk5	TSP	50 mg/m^3
3	Acid roaster stack Sk3 Acid roaster stack Sk6	TSP	50 mg/m^3
4	Steam boiler stack Sk8	TSP	50 mg/m^3
5	Sodium sulphate stack Sk7	TSP	50 mg/m^3

Environmental commissioning – monitoring

15. The works approval holder must monitor air emissions during environmental commissioning in accordance with Schedule 3 Table 10.

16. The works approval holder must monitor the discharge to the SDOOL and groundwater monitoring wells during environmental commissioning for concentrations of the identified parameters in accordance with Table 7.

Table 7: Monitoring of ambient concentrations during environmental commissioning and time limited operations.

Discharge point	Monitoring location	Chemical Suites and Units	Frequency	Averaging period	Sampling Methods	Analytical Method
E1 (SDOOL) effluent) F1 flow meter	As depicted in Schedule 1, Figure 2 as E1 and F1	pH (no unit)	Environmental commissioning - two sample events, 3 months apart within the first 6 months of emissions through the discharge point. Time limit operations - monthly sampling event of emissions through the discharge point.	Spot sample	AS/NZS 5667.1 and AS/NZS 5667.10	-
		Salinity (dS/m)				
		Total nitrogen (mg/L)				
		Total phosphorus (mg/L)				
		Total suspended solids (mg/L)				
		Total dissolved solids (mg/L)				
		Volume (kL)	weekly	Cumulative		
GGW02, MW4A, MW9, MW12, MW15, MW16	As depicted in Schedule 1, Figure 2 as	*MAH (BTEX) suite (mg/L)	During commissioning monthly	Spot sample	AS/NZS 5667.11 and AS/AZS 5667.1	USEPA SW 846 - 8260B
		*Total Recoverable Hydrocarbons (TRH) suite (mg/L)				
		*Metals (dissolved) [As, Cr (III), Cr (VI), F, Fe, Co, Cu, Ni, Li, Sb, Se, U, V, Zn] (mg/L)				SEPA 6010, 6020, APHA 3500-Cr B [Cr(IV) only], or other NATA approved methods
		pH (no unit)^				-
		Redox (Eh)^				
		Electrical conductivity (dS/m) ^				
		Lithium (mg/L)	During time			

		Gross-alpha (pCi/L)	limit operations monthly			
		Gross-beta (pCi/L)				
		Ca, Na, Mg, K, sulfate (mg/L)				

** See Appendix 4, Table 11 for chemical suite units.*

^ In-field, non-NATA accredited analysis permitted.

NB-Alternate analytical methods, including in-house laboratory methods are acceptable, provided alternate methods are comparable with those specified and the laboratory undertaking analysis hold relevant NATA accreditation.

17. The works approval holder must record the results of all monitoring activity required by conditions 15 and 16.

Environmental commissioning report

18. The works approval holder must submit to the CEO an Environmental Commissioning Report within 30 calendar days of the completion date of environmental commissioning of the infrastructure specified in condition 1.

19. The works approval holder must ensure the Environmental Commissioning Report required by condition 18 of this works approval includes the following:

(a) a summary of the environmental commissioning activities undertaken, including timeframes and amount of spodumene ore processed, and lithium hydroxide monohydrate, sodium sulphate anhydrous, mixed salts materials, and the mixed de-lithiated beta spodumene with polishing filter materials produced;
(b) results of monitoring undertaken as required in conditions 8, 15 and 16 including comparison to any specified limits in the works approval;
(c) a review of the works approval holder's performance and compliance against the conditions of this works approval; and
(d) where they have not been met, measures proposed to meet the manufacturer's design specifications and the conditions of this works approval, together with timeframes for implementing the proposed measures.

Time limited operations phase

Commencement and duration

20. The works approval holder may only commence time limited operations of infrastructure identified in condition 1, where the Environmental Commissioning Report as required by condition 18 has been submitted by the works approval holder.

21. The works approval holder may conduct time limited operations of the infrastructure specified in condition 1:

(a) for a period not exceeding 180 calendar days from the day the works approval holder meets the requirements of condition 18; or
(b) until such time as a licence for that item of infrastructure is granted in accordance with Part V of the *Environmental Protection Act 1986*, if one is granted before the end of the period specified in condition 21(a).

Time limited operations infrastructure requirements

22. During time limited operations, the works approval holder must ensure that the premises infrastructure and equipment listed in Table 4 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding requirement set out in Table 4.

Time limited operations – authorised emission points

23. During time limited operations, the works approval holder must ensure that the emissions specified in Table 5 are discharged only from the corresponding discharge point(s) and only at the corresponding discharge point location(s).

Time limited operations – emission limits

24. During time limited operations, the works approval holder must ensure that the emissions from the discharge point listed in Table 6 do not exceed the corresponding limit(s) when monitored in accordance with condition 25.

Monitoring during time limited operations

25. The works approval holder must monitor air concentrations during time limited operations for concentrations of the identified parameters in accordance with Schedule 3, Table 10.

26. The works approval holder must monitor the SDOOL discharge and groundwater monitoring wells during time limited operations for concentrations of the identified parameters in accordance with Table 7.

27. The works approval holder must record the results of all monitoring activity required by conditions 25 and 26.

Time limited operations compliance reporting

28. The works approval holder must submit to the CEO a report on the time limited operations within 30 calendar days of the completion date of time limited operations or 30 calendar days before the expiration date of the works approval, whichever is the sooner.

29. The works approval holder must ensure the report required by condition 28 includes the following:

(a) a summary of the time limited operations, including timeframes and amount of spodumene ore processed, lithium hydroxide monohydrate, sodium sulphate anhydrous, mixed salts materials, mixed de-lithiated beta spodumene and polishing filter materials produced;
(b) results of monitoring undertaken as required in conditions 25 and 26, including comparison to any limits specified in this works approval.
(c) a review of performance and compliance against the conditions of the works approval and the Environmental Commissioning Report; and
(d) where the manufacturer's design specifications and the conditions of this works approval have not been met, what measures will the works approval holder take to meet them, and what timeframes will be required to implement those measures.

Records and reporting (general)

30. The works approval holder must record the following information in relation to complaints received by the works approval 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 works approval holder to investigate or respond to any complaint.

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

(a) the works conducted in accordance with condition 1;
(b) any maintenance of infrastructure that is performed while complying with conditions 1, 12 and 22;
(c) monitoring programmes undertaken in accordance with conditions 15, 16, 25 and 26; and
(d) complaints received under condition 30.

32. The books specified under condition 31 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 works approval holder for the duration of the works approval; and
(d) be available to be produced to an inspector or the CEO as required.

Definitions

In this works approval, the terms in Table 8 have the meanings defined.

Table 8: Definitions

Term	Definition
APHA 5540B and c	means *APHA Method 5540: Standard Methods for the Examination of Water and Wastewater.*
AS 4323.1	means *Australian Standard AS 4323.1 Stationary source emissions: selection of sampling positions*.
AS/NZS 3580.14	means *Australian Standard* AS/NZS 3580.14 *Methods for sampling and analysis of ambient air - meteorological monitoring for ambient air quality monitoring applications*.
AS/NZS 5667.1	means *Australian Standard* AS/NZS 5667.1 *Water quality—Sampling Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples.*
AS/NZS 5667.10	means *Australian Standard* AS/NZS 5667.10 *Water Quality - Sampling Guidance on Sampling of Waste Waters*
books	has the same meaning given to that term under the EP Act.
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 info@dwer.wa.gov.au
CO	Carbon monoxide
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V Division 3 of the EP Act.
dewatering	dewatering is defined as the process of draining rainwater or groundwater from an excavated area before construction can begin
discharge	has the same meaning given to that term under the EP Act.

Term	Definition
dissolved metals	As- Arsenic, B- Boron, BA-Barium, Be-Beryllium, Cd-Cadmium, Cr-Chromium, Fe-Iron, Co-Cobalt, Cu-Copper, Mn-Manganese, Ni-Nickel, Se-Selenium, Li- Lithium, Pb-Lead, Sb-Antimony, V-Vanadium, Zn-Zinc, Hg – Mercury.
dS/m	deciSiemens per metre
emission	has the same meaning given to that term under the EP Act.
environmental commissioning	means the sequence of activities to be undertaken to test equipment integrity and operation, or to determine the environmental performance, of equipment and infrastructure to establish or test a steady state operation and confirm design specifications.
Environmental Commissioning Report	means a report on any commissioning activities that have taken place and a demonstration that they have concluded, with focus on emissions and discharges, waste containment, and other environmental factors.
Environmental Compliance Report	means a report to satisfy the CEO that the conditioned infrastructure and/or equipment has been constructed and/or installed in accordance with the works approval.
EP Act	*Environmental Protection Act 1986* (WA).
EP Regulations	*Environmental Protection Regulations 1987* (WA).
kL	kilolitres
LHR	lithium hydroxide refinery
mabgl	metres above ground level
MAH	Monocyclic aromatic hydrocarbons
MBAS	Methylene blue active substances
mg/L	milligrams per litre
monthly period	means a one-month period from the first day of a month until the last day of that same month.
NOx	Oxides of nitrogen
NO_2	Nitrogen dioxide
Operating	means the acceptance of spodumene fee material and reagents to the Premises and the subsequent introduction of spodumene feed material to a processing train to produce lithium hydroxide monohydrate product.
pCi/L	picocuries per litre
PAH	Polycyclic aromatic hydrocarbons
PFAS	Per and polyfluoroalkyl substances
PM	Particulate matter
PM_{10}	Particulate matter 10 micrometres or less in diameter.
$PM_{2.5}$	Particulate matter 2.5 micrometres or less in diameter.
premises	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 works approval.
prescribed premises	has the same meaning given to that term under the EP Act.
SDOOL	Sepia Depression Ocean Outlet Landline
SO2	Sulphur dioxide
SO3	Sulphur trioxide
STP dry	means standard temperature and pressure (0ºCelsius and 101.325

Term	Definition
	kilopascals respectively) dry
strong wind conditions	means wind speeds of 22 knots or greater, or a Beaufort Scale rating of 6 or greater.
suitably qualified engineer	means a person who: (a) holds an engineering tertiary qualification, and (b) has a minimum of at least three years of experience working in civil construction.
time limited operations	refers to the operation of the infrastructure and equipment identified under this works approval that is authorised for that purpose, subject to the relevant conditions.
tpa	Tonnes per annum
Train	means processing train- a pyrometallurgical processing unit followed by a hydrometallurgical processing unit with each respective unit consisting of the general components.
TSP	total suspended particles
USEPA	United States (of America) Environmental Protection Agency
USEPA Method 2	means *USEPA Method 2 Determination of Gas Velocity and Volumetric Flow Rate (Type S Pitol Tube)*
USEPA Method 5	means *USEPA Method 5 Determination of Particulate Matter Emissions from Stationary sources*
USEPA Method 7E	means *USEPA Method 5 Determination of Nitrogen Oxides Emissions from Stationary Sources (Instrumental Analyzer Procedure)*
USEPA Method 201A	means *USEPA Method 5 Determination of PM_{10} and $PM_{2.5}$ Emissions from Stationary Sources (Constant Sampling Rate Procedure)*
USEPA Method 1613B	means *USEPA Method 1613B tetra- Through Octa – Chlorinated Dioxins and Furans by Isotope Dilution (HRGC/HRMS)*
USEPA Method SW 846-8260B	means *USEPA Method 8260B Volatile Organic Compounds by Gas Chromatography / Mass Spectrometer (GC/MS)*
USEPA Method SW 846-8270D	means *USEPA Method 8270D Semivolatile Organic Compounds by Gas Chromatography / Mass Spectrometry*
works approval	refers to this document, which evidences the grant of the works approval by the CEO under section 54 of the EP Act, subject to the conditions.
works approval holder	refers to the occupier of the premises being the person to whom this works approval has been granted, as specified at the front of this works approval.
WWTP	Wastewater Treatment Plant

END OF CONDITIONS

Schedule 1: Premises maps

Premises map

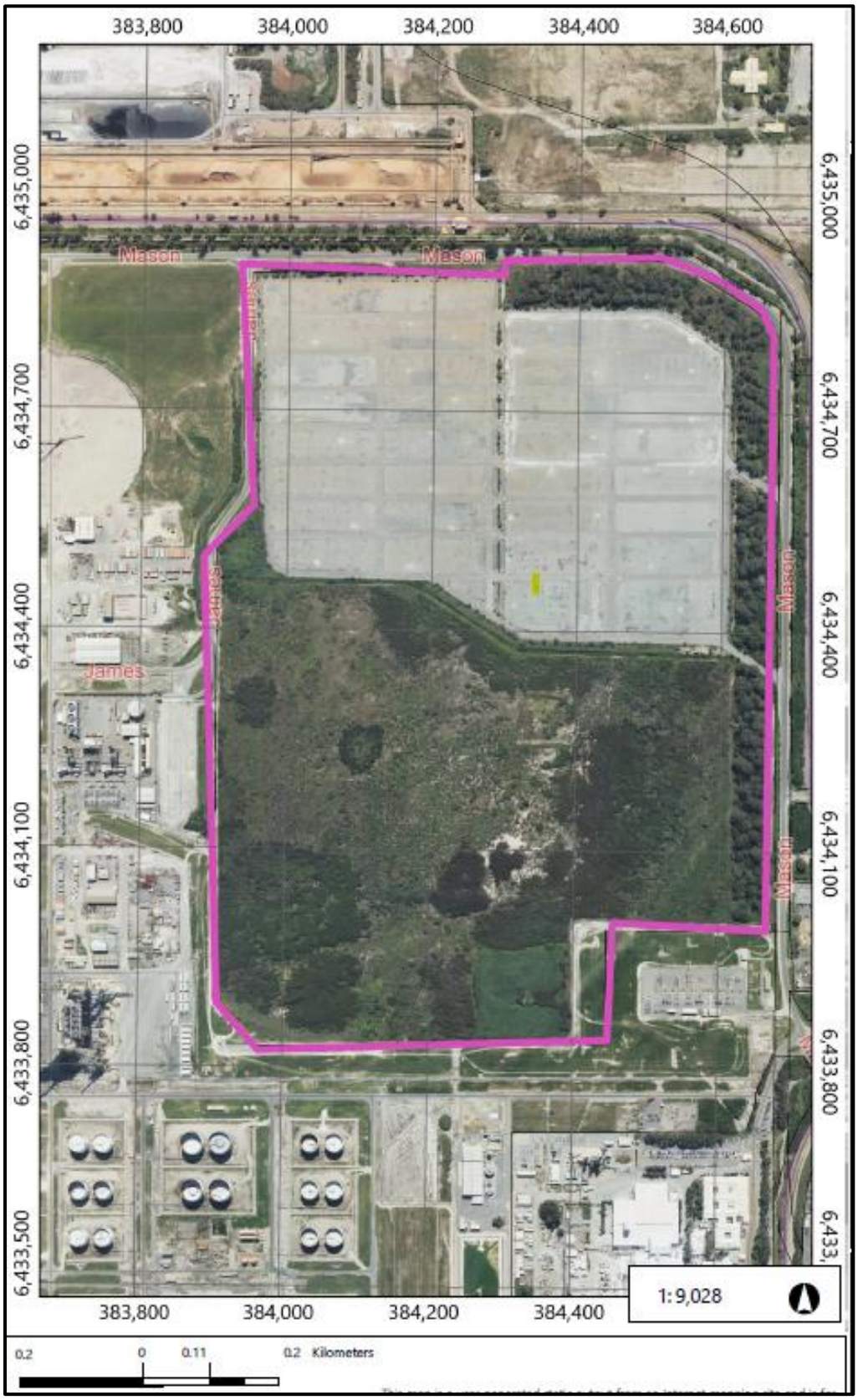

Figure 1: Map of the boundary of the prescribed premises, outlined in pink.

Air Emissions and SDOOL monitoring map

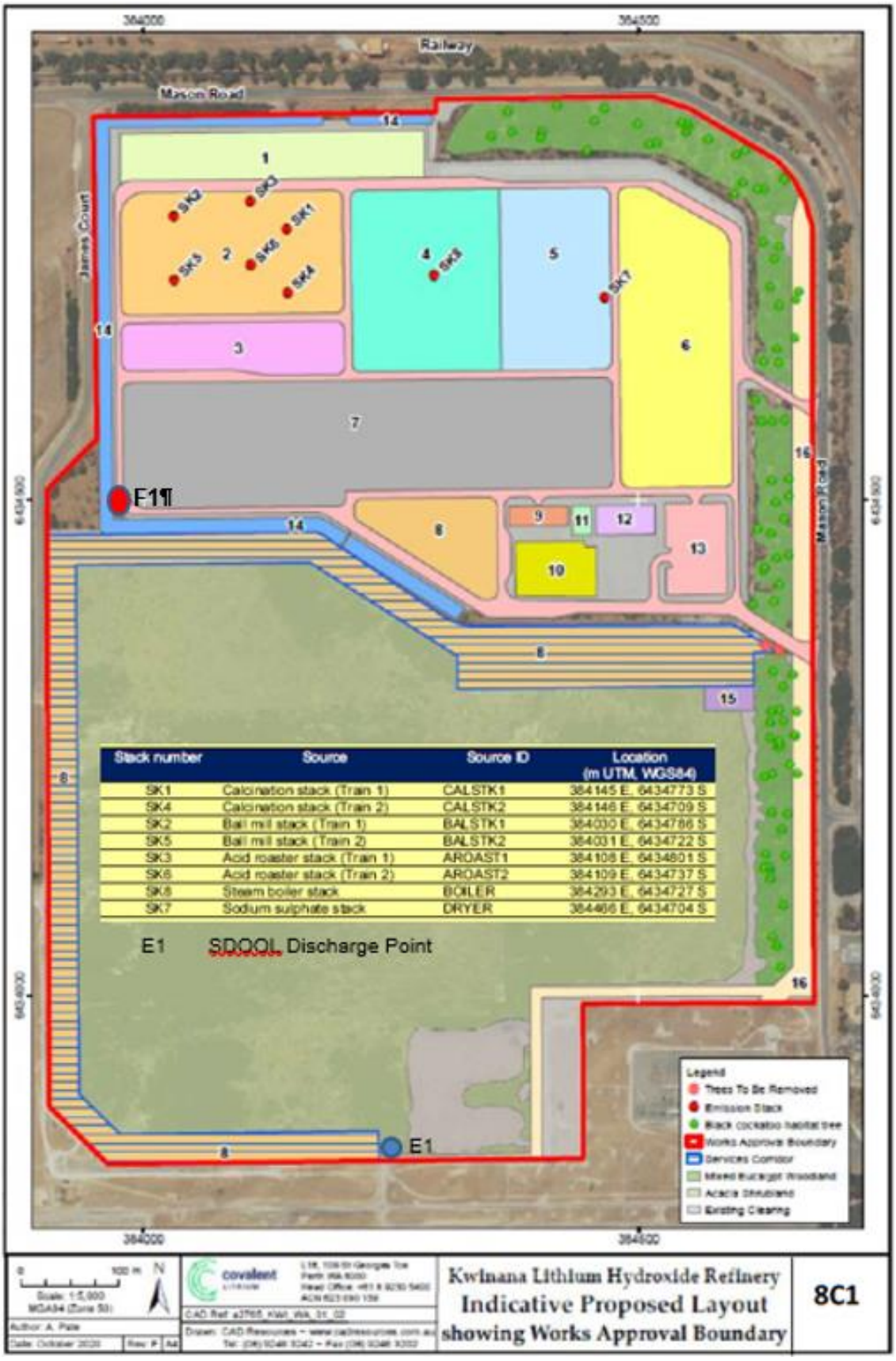

Figure 2: Monitoring points for air emissions and wastewater effluent (E1 is the SDOOL discharge point and F1 is the flow meter on the SDOOL).

Layout map of premises

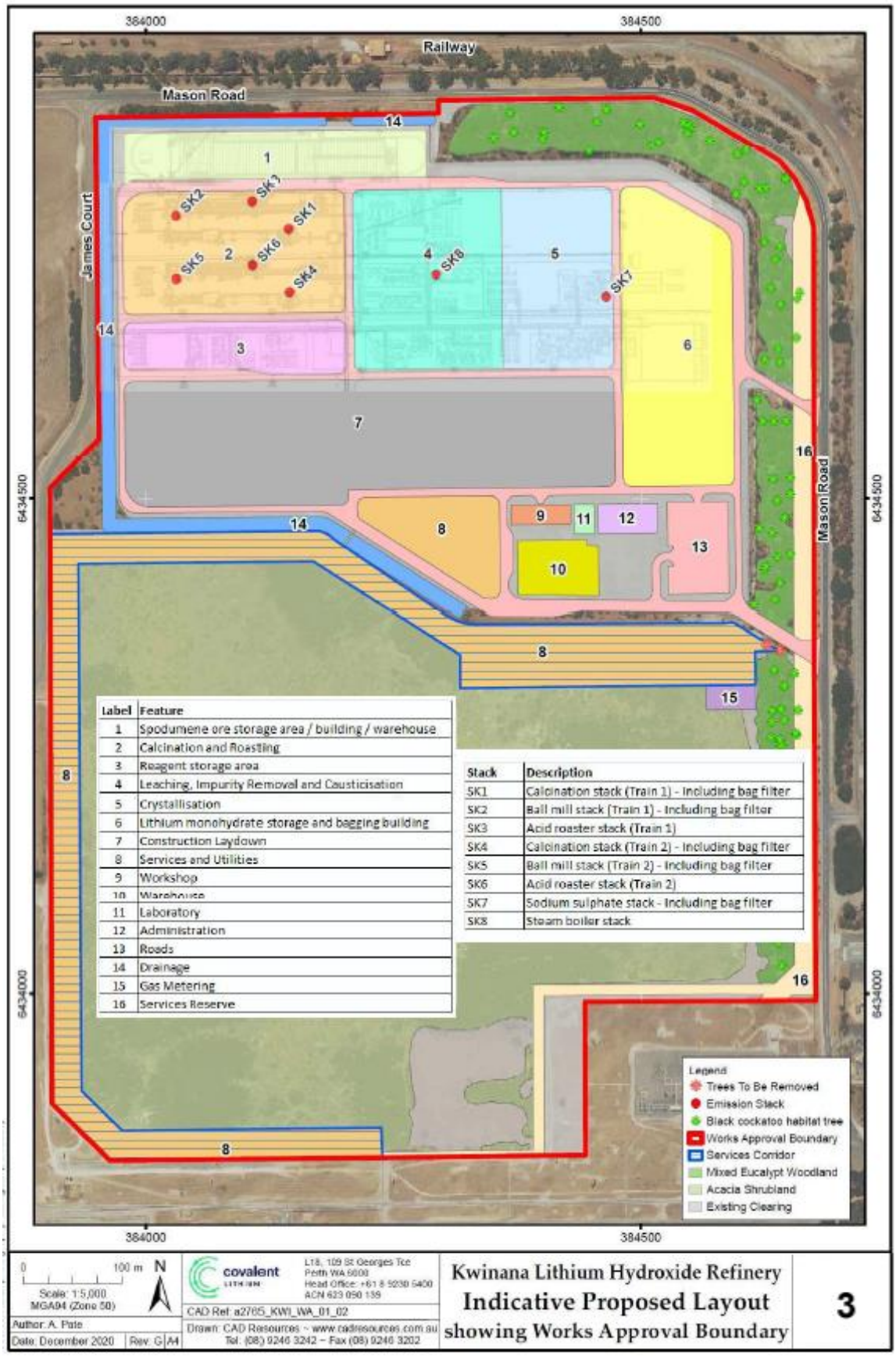

Figure 3: Layout of the lithium refinery

Groundwater monitoring locations

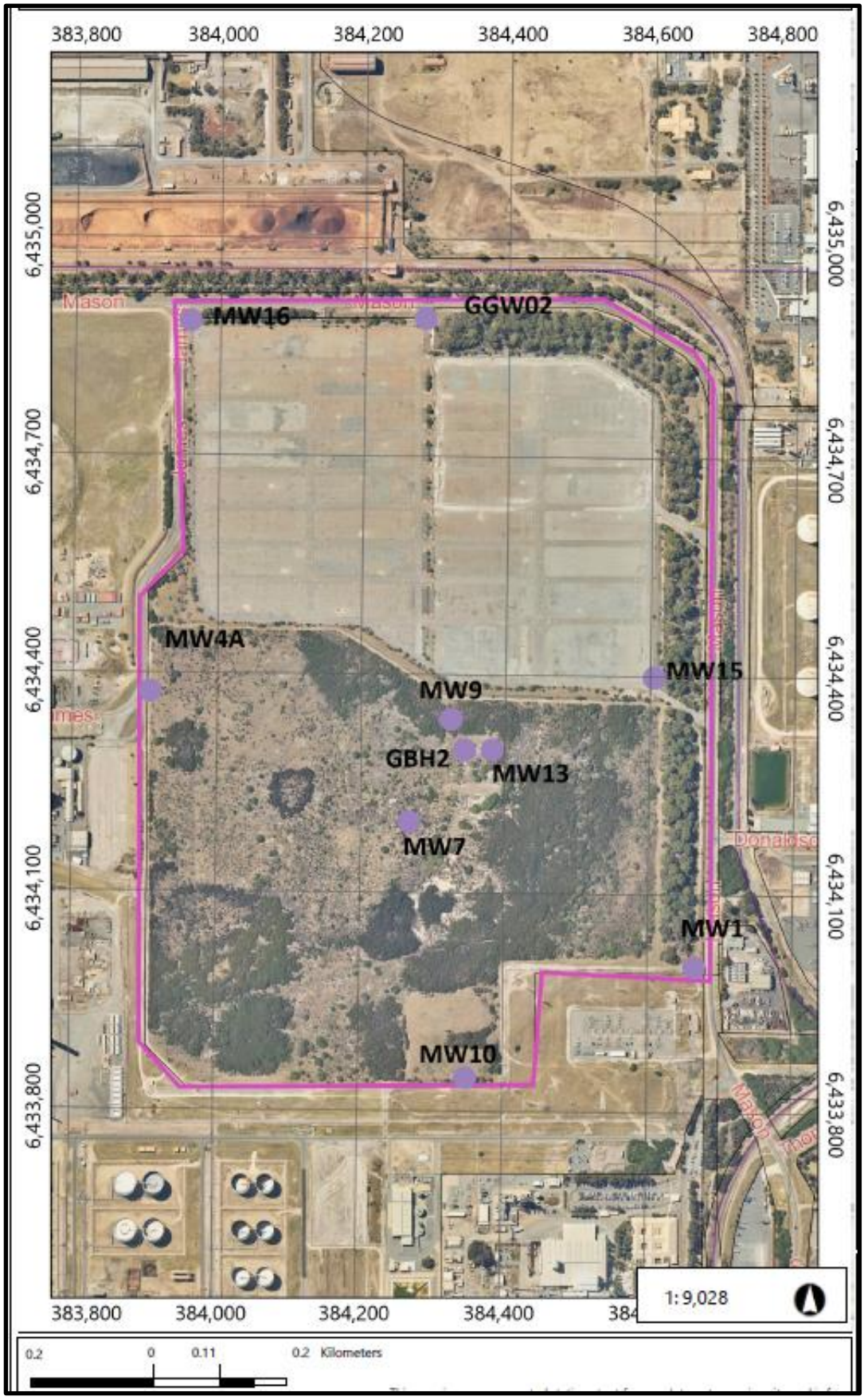

Figure 4: Groundwater monitoring locations.

Schedule 2: Design and construction

Table 9: Design and construction / installation requirements

	Infrastructure	Design and construction / installation requirements	Infrastructure location
1.	Spodumene ore storage area / building / warehouse	Overhead conveyors with enclosed tops and side treatments.	As depicted in Schedule1 Figure 2 as 1
2.	Lithium monohydrate storage and bagging building	Sealed room within the building for lithium bagging. Automated packaging equipment for lithium bagging are held within sealed room. Conveyors operating within and adjacent to the building are sealed. Bagged lithium and sodium products are stored within an enclosed building. Storage building concrete floor is raised above the outside area to prevent stormwater accessing enclosure.	As depicted in Schedule1 Figure 2 as 6
3.	Conveyors	All conveyors external to a building, must be fully enclosed.	No reference
4.	Discharge points to Air	Stacks with a minimum stack height from ground levels as follows: • Train 1 Calcination stack 46m (SK1) • Train 2 Calcination stack 45.7m (SK4) • Train 1 Ball mill stack 25.8m (SK2) • Train 2 Ball mill stack 25.8m (SK5) • Train 1 Acid roaster stack 28.5m (SK3) • Train 2 Acid roaster stack 28.2m (SK6) • Steam boiler stack 11.5m (SK8) • Sodium sulphate stack 10.2m (SK7) All stacks must be fitted with sampling ports that are compliant with requirements of AS4323.1 to allow periodic emissions monitoring.	As depicted in Schedule1 Figure 2 as: SK1 SK4 SK2 Sk5 SK3 SK6 SK8 SK7
5.	Bag filters	All bag filters within the calciner, ball mill, acid roast kilns and sulfate dryer on each processing train must be: • Capable of minimising particulate emissions to less than 30mg/m^3 (STP dry) during normal operating conditions. • Connected to a Process Control System (PCS) with alarms to identify deviations from normal operating conditions including broken bags. • Fitted with a device to ensure bags are routinely kept clean. • Fitted with a device to indicate the pressure differential clearly and accurately across filters. • Bag filter in the calcination area can return dust to the pyrometallurgical process.	As depicted in Schedule1 Figure 3 as: 2

	Infrastructure	Design and construction / installation requirements	Infrastructure location
6.	Acid roast kilns and wet scrubbing systems	Acid roast gas scrubber systems on each processing train must be: • Capable of capturing SO_3 and H_2SO_4 gas emissions to less than 50 mg/Nm^3 during normal operational conditions. • Connected to a Process Control System (PCS) with alarms to identify deviations from normal operating conditions. • Must have a combined cyclonic and chevron type entrapment separator to separate out the scrubbing liquid and the gas from the venturi scrubber outlet. • Must have a quench vessel for further cooling of entrapment separator outlet gases. • Must have an emergency quench water tank • Must have a wet electrostatic precipitator to capture fine particles. • Must have a fibre bed mist eliminator for capturing remaining fine particles and acid mists.	As depicted in Schedule1 Figure 3 as: 2
7.	Stationary equipment	All stationary items of equipment exceeding a manufacturer specified sound pressure level of 85 dBA at 1 m must be either located within a building, have noise attenuating controls (e.g. insulation, the orientation of vents away from external boundaries, application of acoustic lagging), or otherwise is located within a noise attenuating enclosure.	As depicted in Schedule1 Figure 3 as: 1, 2, 3, 4, 5, 6
8.	Reagent storage area	Concreted bunding around the perimeter of the reagent storage area to prevent stormwater from accessing the enclosure. Bunded areas including sump is based on a 6-hour discharge of the volume collected from a 1 in 100-year rainfall event (AEP). All compounds and where they are provided, bunds shall comply with the following requirements. a) The materials of construction shall be substantially immune to attack by any corrosive substance that they may be required to contain b) They shall be sufficiently impervious to retain and to enable the recovery of any spillage. c) Bunded areas and secondary containment facilities have a minimum capacity of 110% of the largest storage vessel plus 25% of the capacity of all stored containers. d) The point at which any pipe passes through the wall of a bund shall be sealed to prevent leakage from the compound. All containers/tanks including their bases, shall be designed and constructed in such a manner as to be resistant to all likely sources of corrosion. All containers/tanks shall be fitted with an appropriate means of indicating the level of its content. All containers/tanks shall be fitted with a high-level alarm and an extra high level cut off device capable of stopping	As depicted in Schedule1 Figure 3 as: 3

	Infrastructure	Design and construction / installation requirements	Infrastructure location
		the filling and overtopping of a container/tank. Bulk fuel stored within a self-bunding tank meeting AS1940.2017	
9.	Stormwater, recycled wastewater treatment and SDOOL, tanks, sumps, and pipes.	All contaminated stormwater is collected within perimeter concrete bunded areas enclosing the following sections: calcination and roasting; reagents; leaching, impurity removal and causticisation; crystallisation; and product packaging and storage areas. All bunds shall comply with the following requirements. a) The materials of construction shall be substantially immune to attack by any corrosive substance that they may be required to contain b) The point at which any pipe passes through the wall of a bund shall be sealed to prevent leakage from the compound. c) All sumps are to be contained with the bunded area. All containers/tanks including their bases, shall be designed and constructed in such a manner as to be resistant to all likely sources of corrosion. All containers/tanks shall be fitted with an appropriate means of indicating the level of its content. All containers/tanks shall be fitted with a high level alarm and an extra high level cut off device capable of stopping the filling and overtopping of a container/tank. Bunded areas including sump is based on a 6-hour discharge of the volume collected from a 1 in 100-year rainfall event (AEP).	As depicted in Schedule1 Figure 3 as: 2, 3, 4, 5, 6
10	Disposal of wastewater to SDOOL	A continuous flowmeter must be installed to monitor the volume of wastewater discharged to SDOOL. A wastewater monitoring point comprising an auto sampler with instrumentation capable of: a) periodically monitoring the quality of wastewater discharged to SDOOL; b) continuously monitoring temperature, conductivity, pH, and c) PCS control system monitor to automatically set off alarms and shutdown of equipment when water quality parameters significantly deviate for an unacceptable period.	As depicted in Schedule1 Figure 2 as: F1 (flow meter) E1 (discharge to SDOOL)

Schedule 3: Emissions and discharge monitoring

Table 10: Emissions and discharge monitoring during environmental commissioning and time limited operations

Discharge Point	Monitoring location	Parameter	Frequency	Minimum averaging period	Reporting unit[1,2]	Method[3,4]
Calcination stack Sk1 Calcination stack Sk4	As depicted in Schedule 1 Figure 2 as Sk1 Sk4	TSP	During commissioning two separate sample events separated by at least one week of emissions through the discharge point. During time limited operations one sample event every six months of emissions through the discharge point.	60 minutes	mg/m^3 g/s	USEPA Method 5 or 17
		PM_{10}				USEPA Method 201A, 17 and ISO13320:2020
		NOx (as NO_2 equivalent)				USEPA Method 7E
		Flow rate			m^3/s	USEPA Method 2
Ball mill stack Sk2 Ball mill stack Sk5	As depicted in Schedule 1, Figure 2 as Sk2 SK5	TSP		60 minutes	mg/m^3 g/s	USEPA Method 5 or 17
		PM_{10}				USEPA Method 201A, 17 and ISO13320:2020
		Flow rate			m^3/s	USEPA Method 2
Acid roaster stack Sk3 Acid roaster stack Sk6	As depicted in Schedule 1, Figure 2 as Sk3 Sk6	TSP		60 minutes	mg/m^3 g/s	USEPA Method 5 or 17
		PM_{10}				USEPA Method 201A, 17 and ISO13320:2020
		SO_2				USEPA Method 8
		SO_3				
		Flow rate			m^3/s	USEPA Method 2
Steam boiler stack Sk8 Sodium sulphate stack Sk7	As depicted in Schedule 1, Figure 2 as Sk8 Sk7	TSP		60 minutes	mg/m^3 g/s	USEPA Method 5 or 17
		PM_{10}				USEPA Method 201A, 17 and ISO13320:2020
		NOx (as NO_2 equivalen$_t$)				USEPA Method 7E
		Flow rate			m^3/s	USEPA Method 2

Note 1: All units are referenced to STP dry.
Note 2: Concentrations of NOx for the calciner fan stacks and sodium sulfate heater stacks to be corrected to STP at 10% oxygen on a dry basis
Note 3: Duplicate sample runs conducted consecutively on the same sampling day
Note 4: Where any USEPA method refers to USEPA Method 1 for the sampling plane, this must be read as referral to AS 4323.1

Schedule 4: Groundwater sampling units

Table 11:Groundwater sampling chemical suites and units during construction and environmental commissioning

Chemical Group	Chemical name
Total Recoverable Hydrocarbons (TRH)	TRH C_6-C_{10} Fraction F1
	TRH>C_6-C_{10} Fraction Less BTEX F1
	TRH>C_{10}-C_{16} Fraction F2
	TRH>C_{10} -C_{16} Fraction Less Naphthalene F2
	TRH>C_{16}-C_{34} Fraction F3
	TRH>C_{34}-C_{40} Fraction F4
MAH(BTEX) suite	Benzene
	Toluene
	Ethylbenzene
	m- Xylene
	o-Xylene
	p-Xylene