



Works approval number W6393/2020/1

Works approval holder Alcoa of Australia Limited

ACN 004 879 298

Registered business address 181-205 Davy Street
BOORAGOON WA 6154

DWER file number DER2020/000196

Duration 12/10/2020 to 12/10/2023

Date of issue 12/10/2020

Premises details Pinjarra Refinery
Lot 19 on Diagram 44739, Part of Lot 109 on
Diagram 60089, Part of Lot 151 on Plan 10914, Lot
221 on Plan 302638, Lot 222 on Plan 302638, Part
of Lot 251 on Plan 35963 and Lot 252 on Plan
35963
Southwest Hwy
OAKLEY WA 6208

Prescribed premises category description (Schedule 1, <i>Environmental Protection Regulations 1987</i>)	Assessed production capacity
Category 46: Bauxite refining	5.0 Million tonnes per annum

This works approval is granted to the works approval holder, subject to the attached conditions, on 12 October 2020, by:

MANAGER, PROCESS INDUSTRIES

an officer delegated under section 20
of the *Environmental Protection Act 1986* (WA)

Works approval history

Date	Reference number	Summary of changes
12/10/2020	W6393/2020/1	Works approval granted.

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, as set out in Table 1.

Table 1: Design and construction / installation requirements

	Infrastructure	Design and construction / installation requirements	Infrastructure location
1.	OBF secondary containment bund (existing)	<ul style="list-style-type: none">• The bund must be extended such that the expanded bund;<ol style="list-style-type: none">(i) is at least 110 per cent of the capacity of the largest tank or vessel within the OBF;(ii) directs all runoff and drainage into existing process water systems;(iii) is constructed of materials that are	As shown in Schedule 1: Figure 3 and Figure 4

	Infrastructure	Design and construction / installation requirements	Infrastructure location
		<p>substantially immune to attack by any corrosive substance it may contain; and</p> <p>(iv) is sufficiently impervious to retain and enable the recovery of any spillage.</p> <ul style="list-style-type: none"> the new (third) bioreactor tank and associated pipework must be installed within the expanded bund. all other equipment must be installed within existing sealed areas or in bunds. 	
2.	No. 3 bioreactor tank	<ul style="list-style-type: none"> The new bioreactor tank must: <ul style="list-style-type: none"> (i) be an enclosed vessel with a vent which directs vapours to the wet scrubber system; (ii) be connected to a cooler; (iii) have a flat bottom tank base manufactured from stainless steel; (iv) be installed with an agitator; (v) be installed with a continuous dissolved oxygen, pH, temperature and tank level monitoring system connected to a process control system with alarms for process excursions; (vi) have oxalate feed rate control; (vii) route overflow to the sump within the secondary containment bund; and (viii) the installed tank agitator must be capable of achieving a sound pressure level of no greater than 83 dB(A) at 1 m. 	
3.	No. 3 wet scrubber system	<ul style="list-style-type: none"> The wet scrubber system must comprise: <ul style="list-style-type: none"> (i) a wet scrubber; (ii) water supply to the scrubber; (iii) a minimum 15 m high (above ground level) scrubber vent stack fitted with a sampling port which complies with AS 4323.1; and (iv) an induced draft fan. The wet scrubber system must have a process feed interlock for the scrubber flow rate and fan operational status that will be closed if water supply to the scrubber drops below 1 kL/hour or if the wet scrubber fan is not running. The installed wet scrubber system must be capable of achieving a sound pressure level of no greater than 83 dB(A) at 1 m. 	
4.	No. 4 air blower	<ul style="list-style-type: none"> The air blower must be installed with: <ul style="list-style-type: none"> (i) at least one blower, fit for purpose to ensure a continuous supply of air to the No. 3 bioreactor tank; and (ii) continuous monitoring of the air supply to the new bioreactor tank via a process control system with an alarm for loss of air. The installed air blower must be capable of 	

	Infrastructure	Design and construction / installation requirements	Infrastructure location
		achieving a sound pressure level of no greater than 83 dB(A) at 1 m.	

Compliance reporting

2. The works approval holder must within 30 calendar days of all 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 required by condition 2(b), must include as a minimum the following:
 - (a) certification by a suitably qualified professional engineer whether or not 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 for all items of infrastructure specified in condition 1; and
 - (c) be signed by a person authorised to represent the works approval holder and contains the printed name and position of that person.

Time limited operations phase

Commencement and duration

4. The works approval holder may only commence time limited operations for the third bioreactor unit once the Environmental Compliance Report as required by condition 2 of this works approval has been submitted by the works approval holder.
5. The works approval holder may conduct time limited operations for infrastructure specified in condition 6:
 - (a) for a period not exceeding 180 calendar days from the day the works approval holder meets the requirements of condition 3 for the infrastructure; or
 - (b) until such time as a licence amendment for the infrastructure is granted in accordance with Division 3 Part V of the *Environmental Protection Act 1986*.

Time limited operations requirements

6. During time limited operations, the works approval holder must ensure that the premises infrastructure and equipment listed in Table 2 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 2.

Table 2: Infrastructure and equipment requirements during time limited operations

	Site infrastructure and equipment	Operational requirement	Infrastructure location
1.	No. 3 bioreactor tank	<ul style="list-style-type: none"> Must be provided with a continuous air supply. Air emissions from the tank must be directed, via a vent, to the wet 	As shown in Schedule 1: Figure 3 and Figure 4

	Site infrastructure and equipment	Operational requirement	Infrastructure location
		scrubber. <ul style="list-style-type: none"> Must be operated with a process control system which: <ul style="list-style-type: none"> (i) continuously monitors dissolved oxygen, pH, temperature and tank levels; and (ii) alarms when there are process excursions for dissolved oxygen, pH, temperature and tank levels. 	
2.	OBF secondary containment bund	<ul style="list-style-type: none"> Process spillages with the bund shall be recovered or directed to the collection sump for recovery. Must be maintained such that bund containment capacity is at least 110 per cent of the capacity of the largest tank or vessel within the bund. 	
3.	No. 4 air blower	<ul style="list-style-type: none"> Must be operated with a process control system which: <ul style="list-style-type: none"> (i) continuously monitors air supply; and (ii) alarms when there is a loss of air supply. 	

7. During time limited operations the works approval holder is authorised to discharge the emissions specified in Table 3, from the corresponding discharge point and at the corresponding discharge point location.

Table 3: Authorised discharge points

Emissions	Discharge point	Discharge point location
Odour Ammonia VOC	No. 3 wet scrubber vent stack	Schedule 1: Figure 4

Air emissions monitoring during time limited operations

8. The works approval holder must monitor emissions during time limited operations in accordance with Table 4.

Table 4: Emission and discharge monitoring during time limited operations

Discharge point and monitoring location	Parameter	Frequency	Averaging Period	Unit	Method
	Volumetric flow rate	At least one sample	As per method	m ³ /s	USEPA Method 2

Discharge point and monitoring location	Parameter	Frequency	Averaging Period	Unit	Method
No. 3 wet scrubber vent stack	Volumetric flow velocity	event must be completed within 30 calendar days of reaching steady-state operation		m/s	
	Odour		Spot sample	OU	AS 4323.3:2001
	Ammonia		30 minutes	mg/m ³ and g/s	USEPA CTM-027
	VOC		30 minutes	mg/m ³ and g/s	USEPA Method 18

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 sampling and analysis undertaken pursuant to condition 8 is undertaken by a holder of a current accreditation from the National Association of Testing Authorities (NATA) for the methods of sampling and analysis relevant to the corresponding relevant parameter.

Noise emissions verification during time limited operations

11. The works approval 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) undertake an assessment of the sound power levels of the new and upgraded infrastructure set out in Table 6 in Schedule 2: Noise validation and compare these to the modelled sound power levels set out in in Table 6 to verify the accuracy of noise modelling undertaken for the OBF upgrade; and
 - (b) provide a noise verification report detailing the outcomes of the assessment undertaken in accordance with condition 11(a).

Compliance reporting

12. The works approval holder must submit to the CEO a report on the time limited operations within 60 calendar days of the infrastructure identified in condition 6 reaching steady-state operation.
13. The works approval holder must ensure the report required by condition 12 includes the following:
 - (a) a summary of the time limited operations, including timeframes for commencement of operations and achievement of steady state operation, and the amount of sodium oxalate processed;
 - (b) the point-source emission monitoring results recorded in accordance with condition 9.
 - (c) the noise verification report prepared in accordance with condition 11(b);
 - (d) a summary of the environmental performance of all items of infrastructure as constructed or installed (as applicable), which at minimum includes records detailing the:
 - (i) hydro-testing of infrastructure installed or upgraded for the purposes of the third bioreactor unit;
 - (ii) commissioning of the third bioreactor unit;
 - (iii) testing the bioreactor unit; and

- (iv) commissioning of the process control system.
- (e) a review of the operational performance and compliance against the conditions of this works approval; and
- (f) where they have not been met, measures proposed to meet the conditions of this works approval, together with timeframes for implementing the proposed measures.

Records and reporting (general)

14. 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 associated with the construction or operation of the infrastructure and equipment specified in condition 1:
 - (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.
15. 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 in the course of complying with condition 6;
 - (c) monitoring programmes undertaken in accordance with condition 8; and
 - (d) complaints received under condition 14.
16. The books specified under condition 15 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 5 have the meanings defined.

Table 5: Definitions

Term	Definition
AS 4323.3:2001	Australian Standard 4323.3:2001: <i>Stationary source emissions, Part 3: Determination of odour concentration by dynamic olfactometry</i>
averaging period	the time over which a limit or target is measured or a monitoring result is obtained
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 <i>Environmental Protection Act 1986</i> Locked Bag 10 Joondalup DC WA 6919 info@dwer.wa.gov.au
commissioning	means the incremental operational changes after the completion of works to establish the biological biomass, introduce sodium oxalate feed material, and reach steady-state operation.
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V Division 3 of the EP Act.
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.
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	<i>Environmental Protection Act 1986</i> (WA).
EP Regulations	<i>Environmental Protection Regulations 1987</i> (WA).
NATA accreditation	means in relation to the analysis of a sample that the laboratory is National Association of Testing Authorities, Australia accredited for the specified analysis at the time of the analysis
OBF	Oxalate Bioremoval Facility (as depicted in Figure 3 and Figure 4 in Schedule 1 to this works approval)
OU	Odour Units
premises	the premises to which this works approval applies, as specified at the front of this works approval 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.
qualified professional engineer	An individual who holds a Bachelor of Engineering and has a minimum of five (5) years demonstrated experience working in the relevant discipline
steady-state operation	refers to the process operating condition as a continuous 30-day period during which the oxalate bioremoval unit identified in this works

Term	Definition
	approval: (a) has an average operating throughput greater than 12 tonnes per day; and (b) output provides an average of 90% or greater destruction capability of the input, as measured by oxalate in effluent.
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.
USEPA	United States (of America) Environmental Protection Agency
USEPA Method 2	means USEPA Method 2 <i>Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)</i>
USEPA Method 18	means USEPA Method 18 <i>Measurement of Gaseous Organic Compound Emissions by Gas Chromatography</i>
USEPA CTM-027	means USEPA Conditional Test Method 027 – Procedure for Collection and Analysis of Ammonia in Stationary Sources
VOC	volatile organic compounds
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.

END OF CONDITIONS

Schedule 1: Maps

Premises map

The boundary of the prescribed premises is depicted by the red line in the map below (Figure 1).

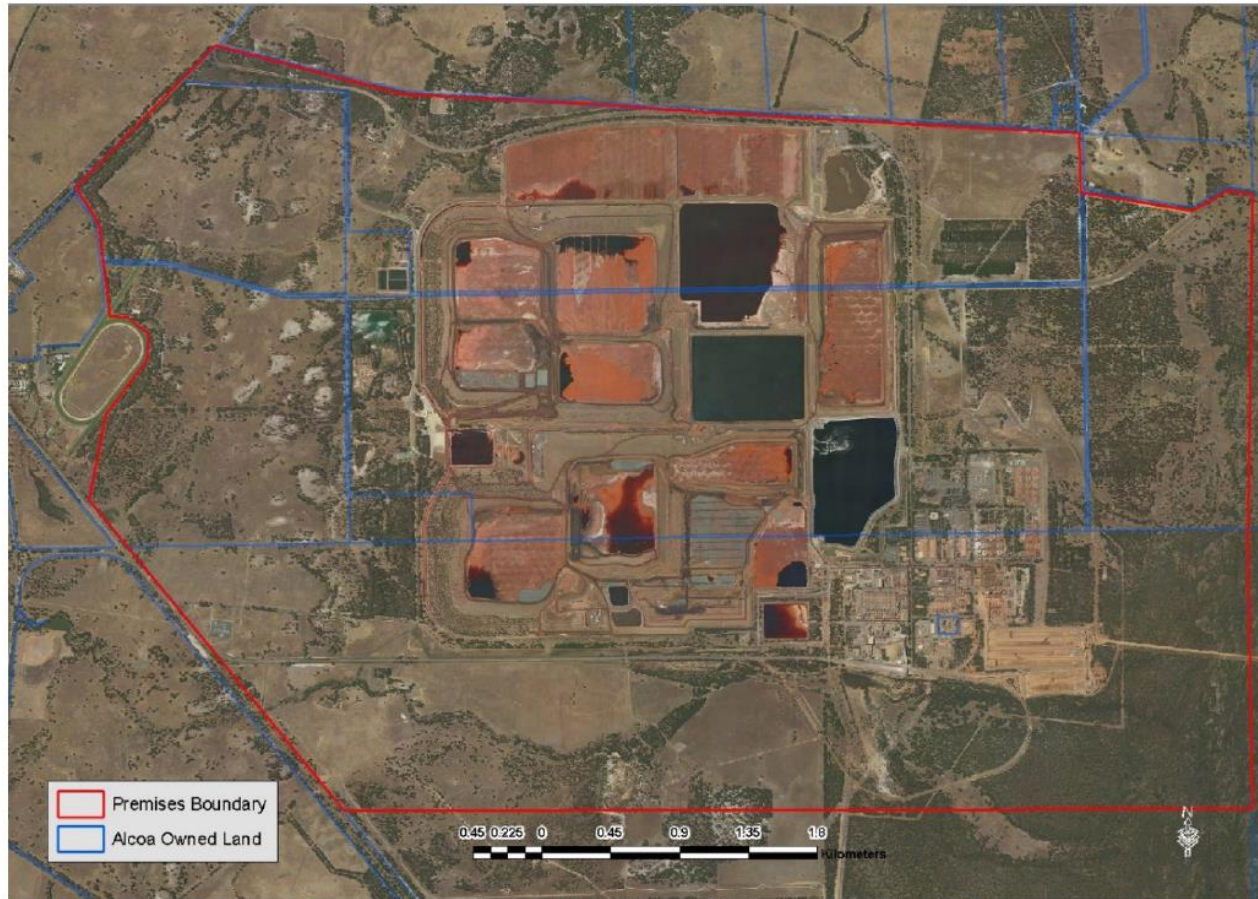


Figure 1: Pinjarra refinery premises boundary

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The boundary of the oxalate bioremoval facility where the works are to be conducted is shown in the map below (Figure 2).



Figure 2: Location of the oxalate bioremoval facility within the premises

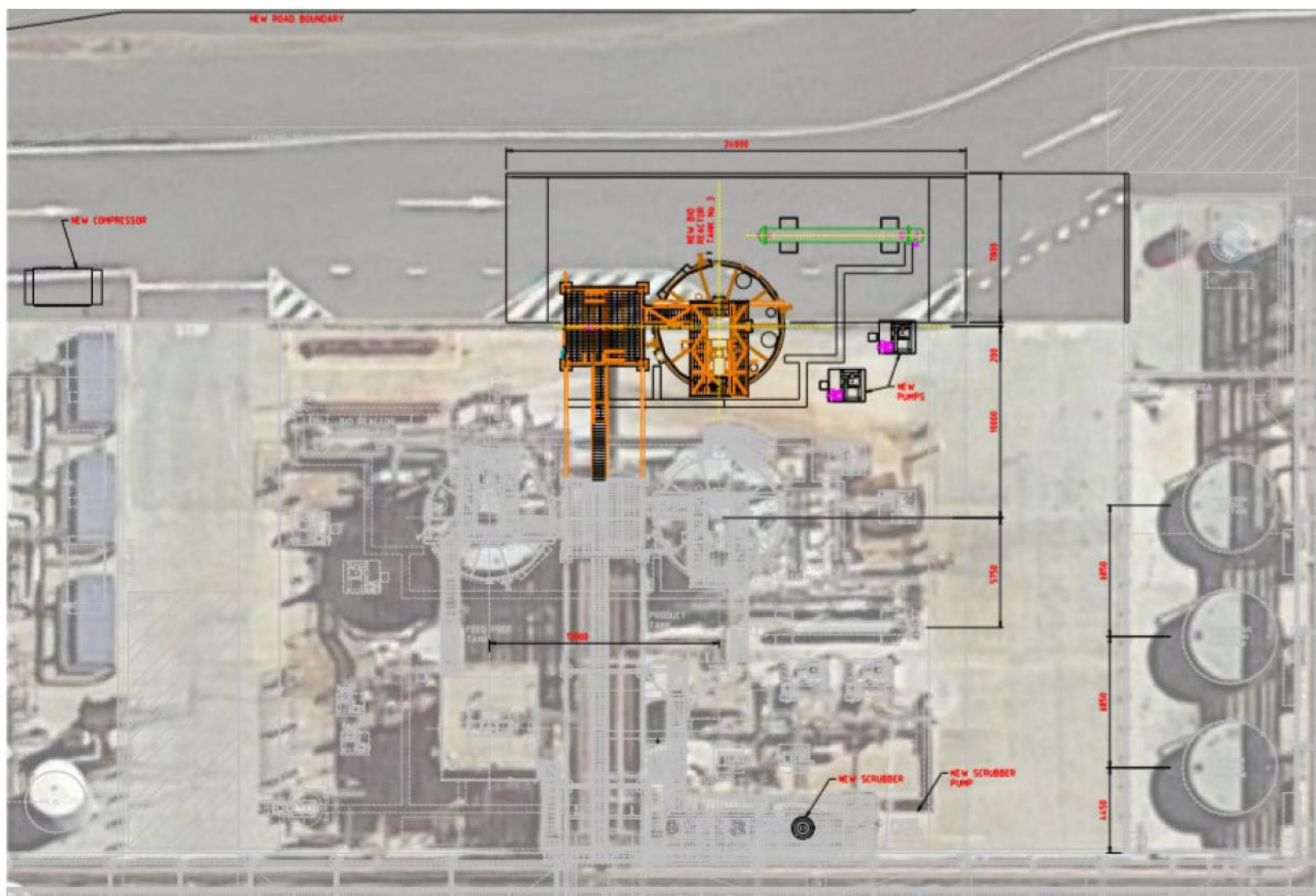


Figure 3: Location of the proposed third bioreactor unit within the oxalate bioremoval facility.

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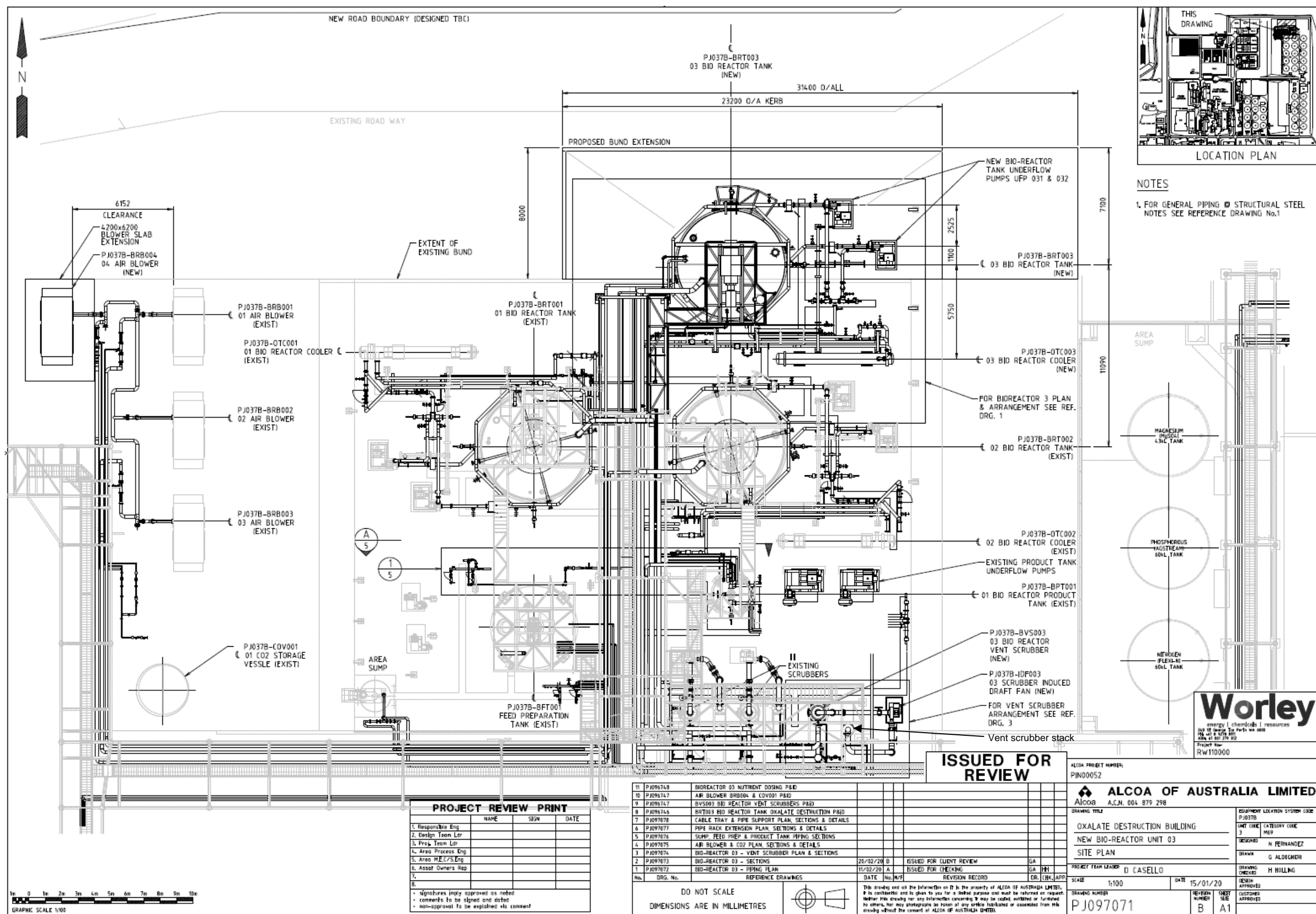


Figure 4: Diagram of the oxalate bioremoval facility with equipment associated with the third bioreactor unit

Schedule 2: Noise validation

Table 6: New and upgraded infrastructure requiring validation of sound power levels

Noise source	Modelled sound power level (Total LW)	Infrastructure location
No. 4 air blower	101.9	Figure 4
No. 3 bioreactor agitator	104.8	Figure 4 (03 bioreactor tank)
No. 3 bioreactor underflow pump	94.8	Figure 4
No. 3 wet scrubber induced draft fan	100.8	Figure 4
Cooling water discharge pump	83.3	Within 10 m of the cooling tower
Oxalate discharge pump	85.7	Within 60 m of the bioreactor tank
Oxalate repulp pump	86.1	Within the Operating Centre #2 main process area (approximately 1.5 km from the bioreactor tank)