Decision Report

Application for Works Approval

Part V Division 3 of the *Environmental Protection Act 1986*

Works Approval Number	W2849/2025/1
Applicant	South32 Worsley Alumina Pty Ltd
ACN	008 905 155
File number	DER2017/001998-1~7
Premises	Worsley Alumina Refinery Gastaldo Road, ALLANSON WA 6225 Legal description - Lease No 3116/7574 being Wellington Locations 5314-5317 on Deposited Plan 220209 As defined by the premises maps attached to the issued works approval
Date of report	12 May 2025
Decision	Granted

Caron Goodbourn
Manager, Process Industries
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction, commissioning and time limited operations of a biological oxalate destruction (BOD) facility at the South32 Worsley Alumina Pty Ltd (South32) Refinery (the Premises/Refinery). As a result of this assessment, works approval W2849/2025/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this decision report, the Department of Water and Environmental Regulation (the department; DWER) has considered and given due regard to its regulatory framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Overview of premises and application summary

The premises is located approximately 15 km north-west of the town of Collie. Its primary function is to refine bauxite mined from the nearby Boddington Bauxite Mine into calcined alumina via the Bayer process.

The Premises operates under multiple prescribed premise categories. The primary prescribed premises category, Category 46: Bauxite refining, is assessed at a production capacity of 4.7 million tonnes per annual period under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which is defined in Licence L4504/1981/17 (L4504). The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in Licence L4504.

On 12 December 2024, South32 submitted an application for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act). The application is to undertake construction works of a BOD facility at the premises. This decision report assesses the emissions and discharges associated with the construction, commissioning and time limited operations of the BOD facility.

2.3 Background and BOD process

Refining bauxite to alumina via the Bayer process produces sodium oxalate (oxalate) as a by-product. Oxalate originates from broken-down organic material in the bauxite and builds up in the recycled caustic liquor circuit. However, as oxalate impacts alumina product quality it is currently removed from the refining process with approximately 30% destroyed via thermal destruction in the liquor burner and the remaining 70% stored in dedicated solar evaporation ponds (SEPs) (see Figure 1 and 2). However, the existing SEPs are nearing storage capacity, and the liquor burner has minimal capacity to increase the destruction rates of oxalate.

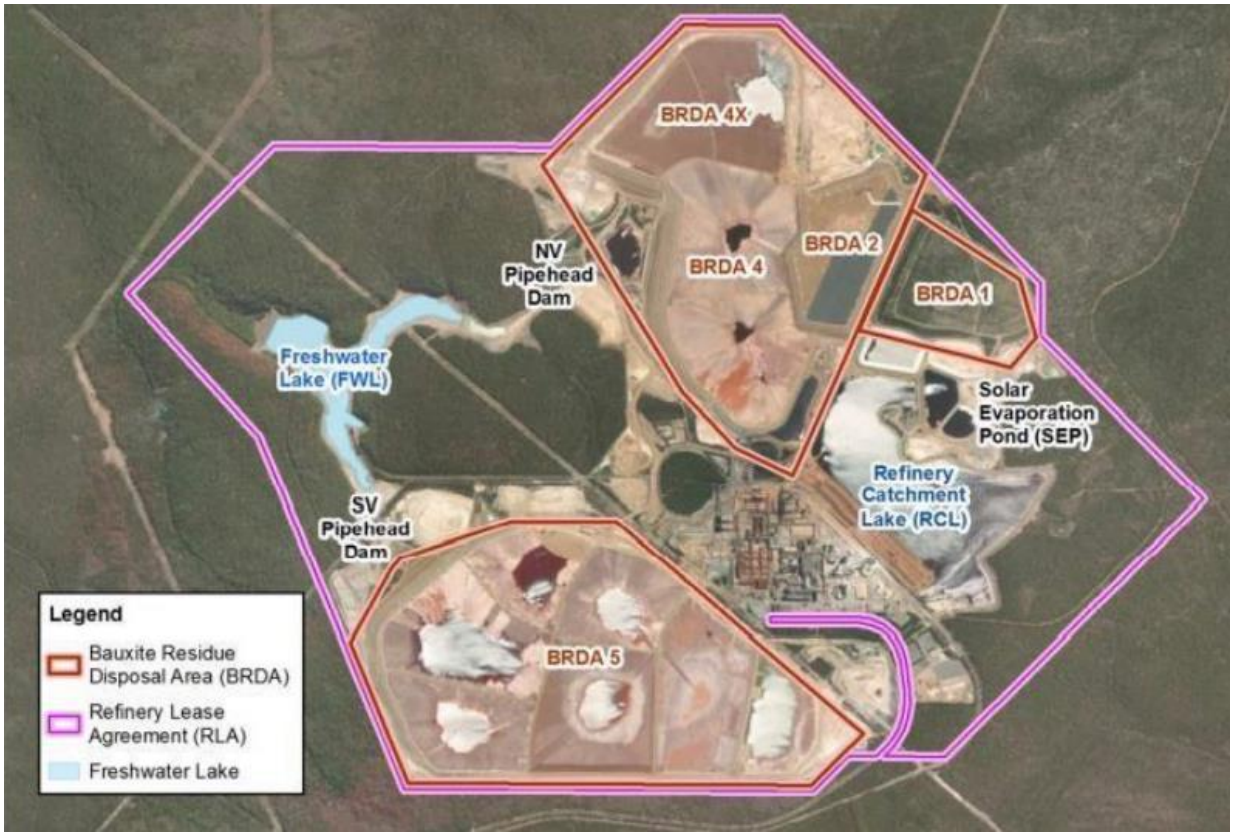


Figure 1 – Location of SEPS, BRDAs and RCL

Figure 2 - Location of BOD facility and associated tie-in facilities

The proposed construction of the BOD facility (see Figure 2 and 3) will implement a new oxalate destruction process for managing oxalate by-product within the Premises. This process involves continuous aerobic biological breakdown of the oxalate to create a sodium carbonate/bicarbonate slurry comprised of approximately 82% water, 7% sodium bicarbonate, 5% sodium carbonate, 3% dawsonite and 2% alumina hydroxide. This is achieved by:

- taking the oxalate from the Liquor Purification Plant (see figure 2), mixing it with water

to form a slurry,

- directing the slurry to the BOD reactors and dosed with nitrogen, phosphorous, magnesium/iron nutrients, carbon dioxide (CO2) to neutralise pH and a defoamer agent, and
- continuous aerobic biological processes to convert the sodium oxalate to the sodium carbonate/bicarbonate slurry using microorganisms within the BOD reactors with aeration and agitation.

The slurry is then directed to a bauxite residue tank for discharge to the Bauxite Residue Drying Areas (BRDAs) or the Refinery Catchment Lake (RCL) during low flow conditions (see Figure 1). It is estimated that approximately 75% of the slurry volume will be discharged to the BRDAs, with the remainder 25% will be directed to the RCL for re-use in Refinery operations. Based on the expected volume of slurry to be discharged from the BOD Facility and the available capacity of the BRDAs and RCL there is no change required to the height of the freeboard in the RCL and the BRDAs.

Construction of the BOD facility will occur over three stages. This Works Approval is for Stage 1 only which will have the capacity to process an average of 90 tonnes of oxalate slurry per day. Stages 2 and 3 will be completed in the future under a different Works Approval and will eventually allow for the combined destruction of 180 tonnes of oxalate slurry per day.

Commissioning of the BOD facility is planned for approximately March 2027 to December 2027. Commissioning will include the following activities:

- Dry commissioning – ensuring all utilities, condensate, cooling water systems, scrubbers and ancillaries are available and operational.
- Wet commissioning – First fills, start-up of feed preparation tank, preparation of reactor tank and scrubber, establish bacteria in reactor and ramp up of reactor. Start-up and ramp up of remaining reactors. Monitor and adjustment to steady state.

Time limited operations (TLO) is likely to commence in December 2027 following completion of the wet commissioning works.

2.4 Noise

The BOD facility will generate noise from rotating equipment such pumps, motors, blowers, and cooling tower fans. The Applicant has committed to ensuring all noise generation equipment of the BOD facility be less or equal to 85 dBA at 1 m from the equipment or will have noise attenuation measures installed to meet compliance.

The refinery operations are currently required to comply with the Environmental Protection (Noise) Regulations 1997 (WA). The BOD facility, which will be part of the Refinery, is not expected to generate noise levels that will result in a significant increase in the cumulative noise impact levels from the Refinery.

Cumulative noise levels generated from the Refinery Prescribed Premises Area (as defined in licecne L4504/1981/17) and the Contingency Bauxite Mining Envelope (CBME) are required to be below the regulatory assigned levels (< 35 dB(A); LA10 night-time (2200 to 0700 hours) under the Environmental Protection (Noise) Regulations 1997 (WA) at surrounding sensitive receptor sites (Figure 4).

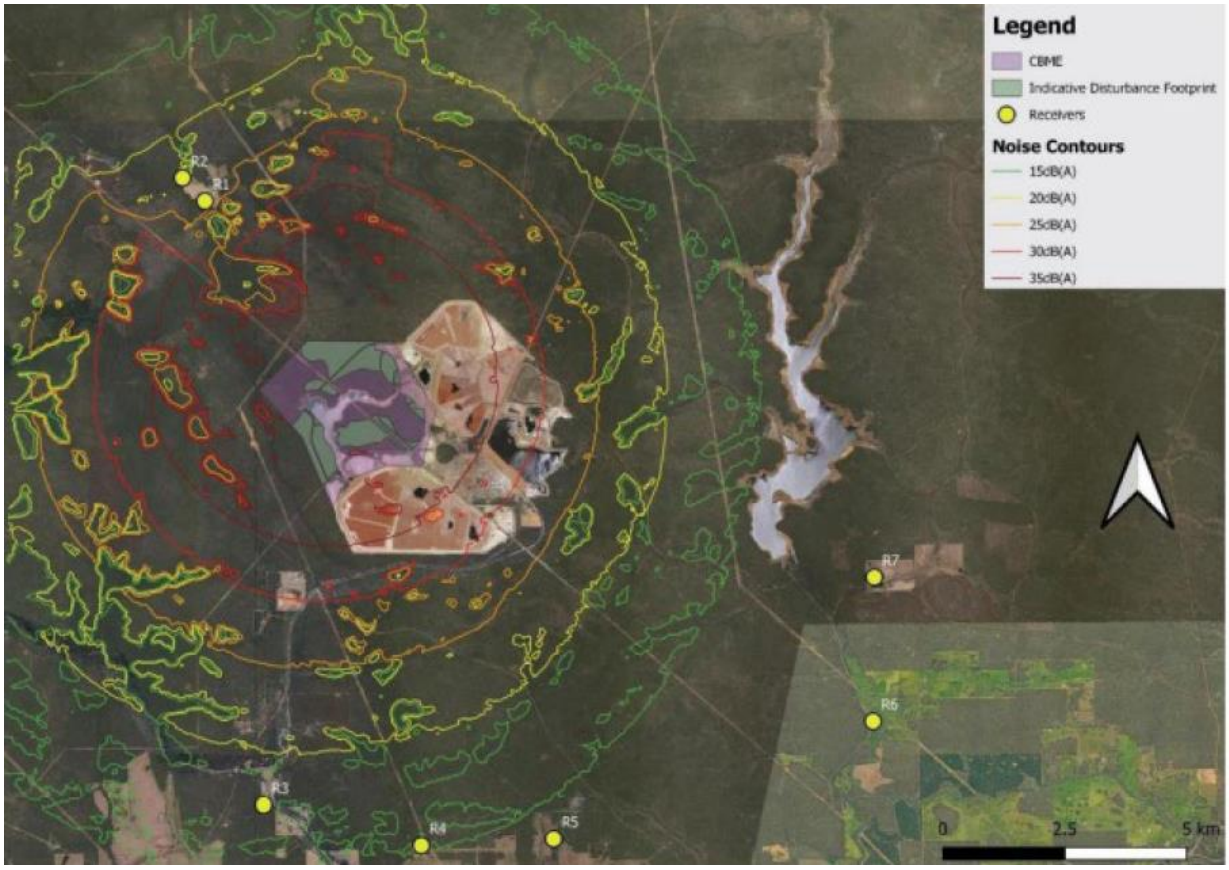


Figure 3 – modelled noise risk ratings for nearest sensitive receptors

Predicted noise modelling was undertaken based on a worst-case mining scenario where the activities in the CBME may produce a combined sound power level (SPL) of 123.6 dB(A). The noise modelling indicated that noise levels would not exceed the maximum threshold of 25 dB(A) at any of the sensitive receptors during worst-case meteorological conditions with sensitive receptors around the Prescribed Premises area. It should be noted that the noise assessment was undertaken for worst case scenario (i.e., blasting) for mining operations in the Contingency Bauxite Mining Area (CBMA), not the Refinery processing area. However, it is assumed that blasting operations in the CBMA would generate more noise than Refinery operations.

2.5 Part IV of the EP Act

Ministerial Statement (MS) 719 and 1237 applies to the Worsley Alumina Refinery and the associated Boddington Bauxite Mine. In relation to the current application, Worsley Alumina is required to implement the Water Resource Management Plan for the protection and management of nearby proclaimed water resources and to give effect to a zero discharge to these natural resources, and thereby not diminish their environmental value or use. The site undertakes a monthly water balance assessment which includes measurement of daily rainfall, pan evaporation and predictive rainfall events such that stormwater capture. This capture and diversion allows for zero discharge following the incidence of a 1:1000 year annual exceedance rainfall event. In emergency situations the site undertakes water transfer between all onsite containment systems (as required).

All surface and groundwater monitoring is undertaken under the MS with the purpose of noting changing rainfall patterns, and to addresses strategic water source planning and to protection of water quality in the Augustus River, which is located downstream of the refinery. It provides for the maintenance of environmental water use, surface and groundwater quality monitoring and management and clean-up of spills, as well as on site contamination.

In relation to fugitive dust emissions from the BDRA's, MS 719 also applies to the management of fugitive dust emissions, incidents and complaints management as well as annual reporting on ambient particulate air quality. The main source of dust at the refinery is from the BRDA's and this is influenced by the moisture of the dry BRDA's, trafficable area dust lift off, construction activities, prevailing weather and wind conditions and ongoing dust mitigation and management measures.

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk Assessments* (DWER 2020).

To establish a risk event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during construction, commissioning and time limited operations which have been considered in this decision report are detailed in Table 1 below. Table 1 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 1: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Construction of BOD reactor	Air / windborne pathway	Continuous monitoring of PM10 at the licence (L4504/1981/17) boundary and ongoing opportunistic observations for visual airborne dust. Implementation of the applicants Spill Management Procedure to contain and clean up any potential spills of sodium oxalate (generates dust when dry)
Noise			Commitment to compliance with the Environmental Protection (Noise) Regulations 1997 (WA) and to the applicant's noise standard of 85 dBA at 1 m or will have noise attenuation measures installed to meet compliance
Commissioning/Time Limited Operation			
Point source air emissions (including ammonia, volatile organic	Operation of BOD reactor	Air / windborne pathway	Air emissions from the BOD reactor tanks are passed through a wet scrubber prior to discharge to air. Monitoring and management protocols will be implemented to ensure optimal BOD

Emission	Sources	Potential pathways	Proposed controls
compounds, carbon dioxide, hydrogen sulfide and negligible amounts of mercury)			performance. These controls include engineering controls to monitor dissolved oxygen (DO), temperature and BOD reactor tank levels, which will be connected to alarms. Nutrient flow rate is monitored by consistent monitoring of the oxalate influent rate and minimisation of point-source air emissions. By effectively monitoring and managing nutrients, DO and influent rate it is expected the levels of odour and NH3 will be reduced, and there will be limited emissions. pH will be monitored by daily routine sampling and analysed under laboratory conditions.
Dust			Continuous monitoring of PM10 at the licence (L4504/1981/17) boundary and ongoing opportunistic observations for visual airborne dust. Implementation of the applicants Spill Management Procedure to contain and clean up any potential spills of sodium oxalate (generates dust when dry)
Noise			Commitment to compliance with the *Environmental Protection (Noise) Regulations 1997 (WA)* and to the applicant's noise standard of 85 dBA at 1 m or will have noise attenuation measures installed to meet compliance
Wastewater		Seepage to soil and groundwater	BRDAs are clay lined and have leachate collection drains to collect seepage and redirect to the RCL for re-use in refinery operations.
Spill, ruptures, and loss of containment			Spills are contained as soon as possible. Drains or other means for environmental release are protected by confining the spill to a small area with absorbent material. Bunding installed around the oxalate feed, reactors and nutrient storage areas. The following sumps will also be installed to collect any process spillages, drainage and rainwater falling within process areas: • Surge tank and feed preparation area sump – as this may be caustic, the sump discharge will be directed to the BOD oxalate surge tank. • Cooling tower area sump – the sump discharge will contain cooling water chemicals including biocide and will therefore be directed to the product tank rather than the BOD reactors.

Emission	Sources	Potential pathways	Proposed controls
			• BOD reactor area sump – the sump discharges will be directed to the surge tank to avoid contaminating the contents of the BOD reactors. The ability to discharge back to the BOD reactors is also provided.

3.1.2 Receptors

In accordance with the *Guideline: Risk Assessment* (DWER 2020), the Delegated Officer has excluded the applicant's employees, visitors, and contractors from its assessment. Protection of these parties often involves different exposure risks and prevention strategies and is provided for under other state legislation.

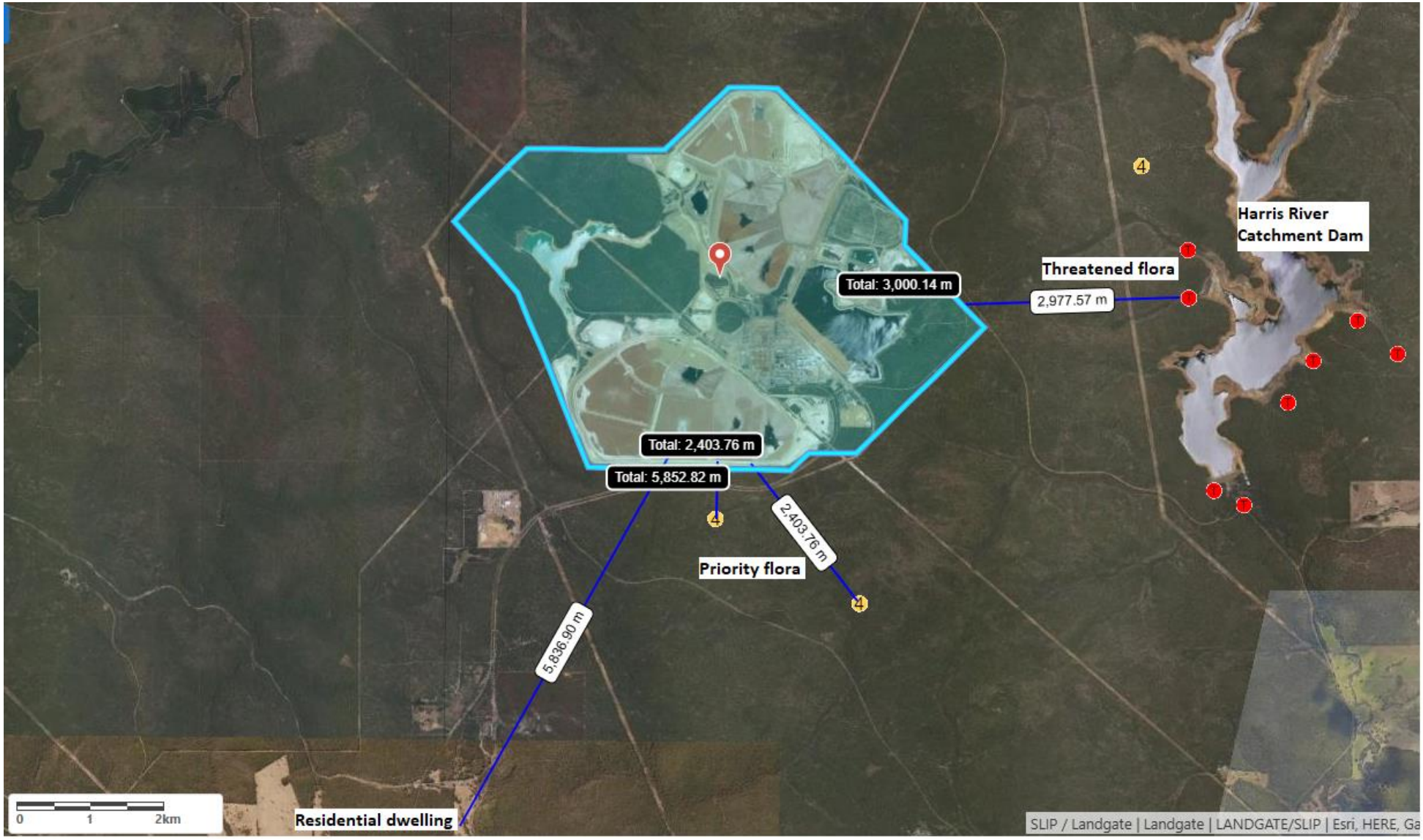
Table 2 and Figure 5 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental Siting* (DWER 2020)).

Table 2: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Single Rural dwellings	No rural dwellings within 5km of the premises. Single residential dwelling approximately 6 km south of the most southern bauxite residual storage areas.
Environmental receptors	**Distance from prescribed activity**
Priority 1 Public Drinking Water Source Area (PDWSA)	The Priority 1 Harris River Catchment Dam Area. However, surface water and groundwater protection is managed under Ministerial 719.
Major watercourses/waterbodies	The refinery Freshwater Lake feeds into the Augustus River. However, surface water protection is managed under Ministerial 719.
Groundwater	Groundwater beneath BRDA is collected via a specifically designed groundwater underdrainage system that reports to the freshwater lake. However, groundwater protection is managed under Ministerial 719.
Rights in Water and Irrigation Act 1914 (RiWI Act)	Premises lie across the boundary of the following surface water areas: Collie River Irrigation District. Brunswick River and tributaries However, surface water protection is managed under Ministerial 719.
Waterways Conservation Areas	Leschenault Inlet Management Area adjoins western point of the premises boundary. However, surface water protection is managed under Ministerial 719.

Threatened/Priority Flora	A number of priority flora species within proximity of the premises boundary, the closest to the being 790m south, and 2.4km southwest of the BRDA 5, and 3.0km east of the Premises boundary. However, flora protection is managed under Ministerial 719.

Figure 4: Distance to sensitive receptors



3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the delegated officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 3.

Works approval W2849/2025/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 3 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the BOD facility. A risk assessment for the operational phase has been included in this decision report, however licence conditions will not be finalised until the department assesses the licence application.

Table 3: Risk assessment of potential emissions and discharges from the premises during construction, commissioning and time limited operations

Risk Event					Risk rating[1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions[2] of works approval	Justification for additional regulatory controls
Source/Activities	**Potential emissions**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Construction								
Construction of BOD facility, including demolition of disused diesel tank in project area, mechanical earthworks, relocation of diesel tanks, mobile concrete batching, construction of roadworks and installation of gates	Dust	**Pathway:** Air/windborne pathway **Impact:** Health and amenity	Residential dwellings approximately 6 km from the premises	Refer to Section 3.1.1	*C = slight* *L = rare* ***Low Risk***	*Y*	*N/A*	The Delegated Officer does not expect significant dust impacts during the construction phase, taking into considering the size, scale and scope of works and the distance to the nearest receptor.
	Noise			Refer to Section 3.1.1	*C = slight* *L = rare* ***Low Risk***	*Y*	*N/A*	The Delegated Officer does not expect significant noise impacts during the construction phase.
Commissioning and time limited operations								
Use of BOD facility during commissioning phase and time limited operations	Dust	**Pathway:** Air/windborne pathway **Impact:** Health and amenity	Residential dwellings approximately 6 km from the premises	Refer to Section 3.1.1	*C = slight* *L = rare* ***Low Risk***	*Y*	*N/A*	The Delegated Officer notes that oxalate is fed into the BOD reactors as a slurry and is treated using a wet process and therefore does not expect that oxalate dust emissions will occur from the operation of the BOD facility. Dust emissions may occur if slurry is spilled from the process and dries out. Based on the conditions on the premises licence L4504/1981/17 and the requirement for dust monitoring in accordance with the requirements of Ministerial 719, the Delegated Officer considers the risk associated with oxalate dust emissions to be low.
			Nearby vegetation, and Augustus River approximately 4km northwest of the BRDA		*C = slight* *L = rare* ***Low Risk***			

Risk Event					Risk rating[1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions[2] of works approval	Justification for additional regulatory controls
Source/Activities	**Potential emissions**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Use of BOD facility during commissioning phase and time limited operations	Noise from pumps, motors, blowers, and cooling tower fans to atmosphere		Residential dwellings approximately 6 km from the premises	Refer to Section 3.1.1	*C = slight* *L = rare* ***Low Risk***	*Y*	Condition 1 Condition 15 Condition 19	The Delegated Officer has accepted the marginal increases in noise on the basis that it is not expected to have a discernable impact of the existing noise emissions profile. The risk of noise is low risk if the applicant achieves predicted noise outcomes associated with the infrastructure and equipment. The Delegated Officer considers the applicant's controls to minimise the risk of loss of containment events are necessary to be included as construction and operational conditions in the works approval.
	Point-source air emissions (including ammonia, volatile organic compounds, carbon dioxide, hydrogen sulfide and trace amounts of mercury)			Refer to Section 3.1.1	*C = slight* *L = rare* ***Low Risk***	*Y*	Conditions 1 – 9, and 12-17.	The Delegated Officer considers the applicant's proposed process controls will minimise the risk to the health and amenity of human receptors outside of the facility. However, the Delegated Officer considers the applicant's management controls are necessary to be included as construction and operational conditions in the works approval.
	Wastewater	**Pathway:** Discharge to BRDAs - seepage through BRDA into groundwater **Impact:** Soil, groundwater and surface water contamination	Groundwater and surface water (Harris River Catchment)	Refer to Section 3.1.1	*C = slight* *L = rare* ***Low Risk***	*Y*	*N/A*	Ministerial Statement 719 requires the applicant to monitor groundwater and surface water of the Premises. Therefore, the Delegated Officer does not consider any additional ambient monitoring to be required relating to the BOD facility.

Risk Event					Risk rating[1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions[2] of works approval	Justification for additional regulatory controls
Source/Activities	**Potential emissions**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Use of BOD facility during commissioning phase and time limited operations	Spills, ruptures and loss of containment	**Pathway:** Infiltration into soil and groundwater **Impact:** Localised contamination of soil and groundwater	Soil and groundwater	Refer to Section 3.1.1	*C = slight* *L = rare* ***Low Risk***	*Y*	Conditions 1 - 3 Condition 12	Loss of containment events would be expected to be low volume and short-term duration events confined to the immediate area around the BOD. The Delegated Officer considers the applicant's proposed process controls and secondary containment bunding will minimise the likelihood of containment loss outside of the facility. However, the Delegated Officer considers the applicant's controls to minimise the risk of loss of containment events are necessary to be included as construction and operational conditions in the works approval. With respect to groundwater and surface water, the Delegated Officer considers the requirements in Ministerial Statement 719 adequately addresses the protection of surface and groundwater. Therefore, the Delegated Officer does not consider any additional ambient monitoring to be required

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk Assessments* (DWER 2020).

Note 2: Proposed applicant controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

4. Consultation

Table 4 provides a summary of the consultation undertaken by the department.

Table 4: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 15 January 2025	No comments received	N/A
Application advertised in the West Australian newspaper on 20 January 2025	No comments received	N/A
Local Government Authority advised of proposal on 16 January 2025	No comments received	N/A
Applicant was provided with draft documents on 11 February 2025	Provided feedback and additional information between 10 and 26 March 2025. Summary provided in Appendix 1	Summary provided in Appendix 1

5. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that W2849/2025/1 will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
4. Alumina Refinery (Worsley) Agreement Act 1973

Appendix 1: Summary of applicant's comments on risk assessment and conditions on the first draft works approval

Condition	Summary of applicant's comment	Applicants proposed change(s)/commitments	Department's response
N/A	Requested an extension to the proposed expiry date of the WA	Requested to extend the expiry date from 2028 to 2030	Supported. Expiry date amended to 2030
Condition 1, Table 1	Requirement 1c - Requested a change of wording to allow spillages to be directed to different destinations for reuse and recovery depending on the issue or reason for the loss of containment.	Suggest rewording to 'has dedicated sumps and transfer pumps to *recover spillages or containment losses*.'	A change to the destination of the spilled product does not increase the potential risk to receptors. Therefore, the department supports the change to the wording of Item 1 c).
	Requirement 2a - an additional minor vent will be installed on all BOD reactor tanks for safety purposes. The vents prevent the tank(s) from collapsing if there is a loss of vacuum.	Suggest rewording to 'comprise of an enclosed bioreactor tank with a vent which directs all vapours, *under standard operating conditions*, to the wet scrubber system'	Supported.
	Requirement 2b - The reactors are connected to the cooling towers via a heat exchanger.	Suggest rewording to 'must be connected to a cooling tower *system*'	Supported.
	Requirement 2e – Requested removal of pH from the requirement, as errors have been identified with continuous pH monitoring and suggest that it is not reliable.	Worsley will continue to monitor pH through daily routine sampling under laboratory conditions.	Reference to pH has been removed and a new requirement has been introduced into Table 5 requirement 1d - 'pH monitored by daily routine sampling and analysed under laboratory conditions'.
	Requirement 5 b ii – Requested change of reference to the height of the scrubber stack	Current design is 18.9 metres above ground level. Suggest rewording to 'each stack emission point is *at least* 18 metres above ground level'	Supported.
	Requirement 5 b v – Requested change to flexibility to the discharge location of spent water	Suggest rewording to 'spent water *to be recovered and reused in the circuit or discharged to the Bauxite Residue Disposal Areas (BRDAs) or Refinery Catchment Lake (RCL).'*	Supported.
4	The construction of the BOD facility requires a	Insert Environmental Commissioning requirements	Conditions 4 to 13 have been inserted into the new draft Works Approval reflecting the

Condition	Summary of applicant's comment	Applicants proposed change(s)/commitments	Department's response
	period of Environmental Commissioning		requirements for Environmental Commissioning
Condition 5, Table 2			Renumbered as Condition 14 Table 5
	Requirement 1b – a change to the wording to reflect additional minor vents	It is proposed that an additional minor vent is installed on all BOD reactor tanks for safety purposes to prevent the tanks from collapsing should there be a loss of vacuum. This would not be engaged during standard operating conditions	The department reworded the requirement to: *Air emissions from each BOD reactor tank must be directed, via a vent, to its dedicated wet scrubber during standard operation conditions, or temporarily via a minor relief vent to prevent tank collapse if a loss of vacuum is experienced.*
	Requirement 1c – requested removal of pH from the requirement, as errors have been identified with continuous pH monitoring and suggest that it is not reliable.	Worsley will continue to monitor pH through daily routine sampling under laboratory conditions.	Reference to pH has been removed and a new requirement has been introduced into Table 5 requirement 1d - 'pH monitored by daily routine sampling and analysed under laboratory conditions'.
	Requirement 1d – request to remove reference to 'bauxite residue tank (Facility 34)' as the discharge will come direct from BOD Facility (049) and remove the phrase 'during low flow conditions' as this cannot be defined.	Suggest 'BOD reactor processed slurry to be directed for discharge to the Bauxite Residue Drying Areas (BRDAs), or Refinery Catchment Lake (RCL).'	The original wording was based on the information submitted with the application. However, as the change is unlikely to increase the risk rating of the process, the department reworded the requirement to: BOD reactor processed slurry to be directed for discharge to the Bauxite Residue Drying Areas (BRDAs), or Refinery Catchment Lake (RCL).
	Requirement 2a – requested a change of wording to align with the proposed change of wording of Condition 1, Table 1, Requirement 1c.	Any spillages are to be recovered back into the corresponding circuit or discharged to the BRDA or RCL. Suggest 'Process spillages within the bund shall be recovered via sump(s) and directed to the receiving tank as specified in Table 1, Item 1(c) *or discharged to the Bauxite Residue Disposal Areas (BRDAs), or Refinery Catchment Lake (RCL).*	The original wording was based on the information submitted with the application. However, as the change is unlikely to increase the risk rating of the process, the department reworded the requirement to: *Process spillages within the bund shall be recovered via sump(s) and reused in the circuit or discharged to the Bauxite Residue Disposal Areas (BRDAs) or Refinery Catchment Lake (RCL).'*

Appendix 2: Summary of applicant's comments on risk assessment and conditions on the second draft works approval

Condition	Summary of applicant's comment	Applicants proposed change(s)/commitments	Department's response
N/A	Requested to change the definition and use of 'environmental commissioning'	Definition of 'environmental commissioning' to read: *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.*	Supported. This term and definition aligns with the one used in a similar works approval for a premises operating a similar operation. The term also focusses on the wet commissioning stage where material is introduced to the system and has the potential to create emissions.
Condition 7	Requested to change the wording of Condition 7	Suggested removing the phrase 'during environmental commissioning and time limited operations' resulting in the new wording of: *The works approval holder must monitor emissions in accordance with Table 4*	Supported. This change will allow for monitoring when the BOD system is stable and producing the expected emissions from the system rather than during the environmental (wet) commissioning when the works approval holder will be making minor changes to the process to establish steady-state operations.
Table 4	Request a title change to 'Emissions Monitoring' Amendment to the frequency of sampling.	Requested to change to the frequency of sampling to: *One sampling event completed within 30 calendar days of reaching steady-state operation. A second sampling event completed at least 45 calendar days after the initial sampling event.*	Supported. This change allows for at least two sampling events to be undertaken after steady-state operations being established and will provide sufficient data to be used to assess the stability and consistency of the BOD system prior to the system being included into the Premises licence (L4504/1981/17).
Condition 10	Request to remove Condition 10.	The requirements of Conditon 10 to be incorporated into Condition 16.	Supported. The commencement of TLO (in accordance with Condition 12) currently requires the works approval holder under Conditon 10 to

Condition	Summary of applicant's comment	Applicants proposed change(s)/commitments	Department's response
			submit an Environmental Commissioning Report to the CEO within 30 days of the completion date of environmental commissioning. The delay from producing the Environmental Commissioning Report then submitting it to the CEO before commencing TLO would result in the system being placed on hold. This time period is likely to result in the in-system bacteria to be destroyed and the works holder having to start the process over again to re-establish steady-state operational conditions.
Condition 11 and Conditon 17	Request to combine the requirements of Conditions 11 and 17.	Combine the requirements of Conditions 11 and 17, ultimately to address the requirements of Condition 16.	Supported. Based on the proposed change of Conditon 16 (below), the information that would have been required to address the environmental commissioning stage of Condition 11 are combined in one report with the information that would have been required to address the time limited operations of Condition 17.
Condition 16	Requested to change the wording of Condition 16	Incorporate the requirements of Conditon 10 into Condition 16. Suggested change of wording to: *The Works Approval holder must submit to the CEO a report of <u>the environmental commissioning and</u> time limited operations within 60 calendar days of the completion date of time limited operations or 60 calendar days before the expiration date of the Works Approval, whichever is the sooner.*	Supported. The outcome of getting the information from the environmental commissioning and time limited operations does not change the risk profile of the operations. However, it does allow immediate transition from the steady-state operations achieved during environmental commissioning into time limited operations phase.