Government of Western Australia
Department of Water and Environmental Regulation

Decision Report

Application for Works Approval

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

Works Approval Number	W6887/2024/1
Applicant	South32 Worsley Alumina Pty Ltd
ACN	008 905 155
File number	DER2024/000040
Premises	Nullaga Mine Development Project – Crushing and screening plants Boddington WA 6390 Within tenements: M258SA, M70/25, M70/564, M70/1428 and L70/223.
Date of report	14 January 2025
Decision	Works approval granted

Lauren Edmands

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A/SENIOR MANAGER, RESOURCE INDUSTRIES
INDUSTRY REGULATION (STATEWIDE DELIVERY)
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and/or discharges during the construction and time limited operations (TLO) of the premises. As a result of this assessment, works approval W6887/2024/1 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 Application summary and overview of premises

South32 Worsley Alumina Pty Ltd (the applicant) currently operates and manages the Worsley Bauxite-Alumina Project (Worsley) where the mining and crushing of ore occurs at the Boddington Bauxite Mine (BBM). Ore is transported to the Worsley Refinery (the Refinery) by an overland bauxite conveyor for processing and refining to produce alumina. The alumina is then transported by rail to the Bunbury Port for export. These activities are subject to Part IV Ministerial Statements (MS 719 and MS 1237) which are further discussed in section 2.3 of this decision report. The BBM and the Refinery are regulated under two different *Environmental Protection Act 1986* (EP Act) Part V, Division 3 licences (L5960/1983/11 and L4504/1981/17 respectively).

To support ongoing operations the applicant is planning to expand mining operations into the Nullaga area and to transport Nullaga ore to the existing Marradong facility (authorised under licence L5960/1983/11) via a new 11 km haul road. The ore will be crushed and transported to the Refinery via an overland bauxite conveyor. This project is called the Nullaga Mine Development Project.

On 20 December 2023, the applicant submitted an application under section 54 of the EP Act for a works approval to install and operate two mobile crushing and screening plants. The mobile plants will be used to prepare material such as road base for the construction of the new haul road. In addition, the applicant is seeking approval to construct an oily water separator (OWS) that will be located in a non-process infrastructure (NPI) facility being built as part of the Nullaga Mine Development Project.

The location of the proposed infrastructure is approximately 5.5 kilometres (km) west of the town of Boddington and is located within mining tenements M258SA, M70/25, M70/564, L70/223 and M70/1428 (Figure 1) (the premises).

The premises relates to prescribed premises category 12 and the assessed production capacity (700 000 tonnes per year) under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which is also defined in works approval W6887/2024/1. 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 2020b) are outlined in works approval W6887/2024/1.

It is noted that this decision report and works approval is limited to assessing the impact of emissions and discharges associated with the two mobile crushing and screening plants (for producing road construction material) and the OWS. It does not include assessment or discussion of the wider mining and/or refinery operation.

2.2.1 Crushing and screening infrastructure

Two separate mobile crushing and screening plants will be constructed and used in the construction of the proposed haul road and other infrastructure, by producing suitably sized materials for construction. The proposed haul road and the initial proposed location of the crushing and screening plants are presented in Figure 2.

The haul road, bauxite transport corridor (BTC) and associated mining/maintenance/support at the Refinery was assessed under Part IV of the EP Act by the Environmental Protection Authority (EPA). The assessment is detailed in EPA Report 1768 (EPA 2024b) (discussed further in section 2.3) and is outside the scope of this works approval.

The initial locations for the proposed mobile crushing and screening plants are planned to be situated on cleared pastoral land and therefore no clearing of native vegetation will be required (South32 2023).

The proposed mobile crushing and screening plants will each have a production capacity of 250 tonnes per hour. The applicant has proposed to operate the crushing and screening plants and associated infrastructure 24 hours a day, seven days a week. It is expected that each crusher will have a maximum throughput of 350,000 tonnes per annum (tpa).

The operating area for each mobile crushing and screening plant will be approximately 200 x 150 m in size (Figure 3), consisting of the plant and supporting infrastructure (e.g., stockpiles and auxiliary vehicles). The applicant is considering relocating the crushing and screening plants throughout the prescribed premises to reduce the movement of material throughout the premises, reducing fuel consumption, noise and dust emissions. Due to the potential relocation of crushing and screening plants, the identified potential sensitive receptors (described in section 3.1.2) have been measured from the proposed prescribed premises boundary, as presented in Figure 1 and Figure 2. The department notes these distances are conservative and actual distances from emissions source (i.e., mobile crushing and screening plants) to receptors will be greater than those assessed under the works approval.

Construction of the mobile crushing and screening plants includes mobilisation of equipment to site and establishment of the mobile crusher and associated infrastructure. The construction phase is expected to take a total of seven days. Following construction, mechanical commissioning of the mobile crushing and screening plants is estimated to take two days. Mechanical commissioning will include the following activities:

- Dry commission - dry run of the plant (no feed material) by using the start and stop method to make sure all connections are operational;
- Wet commission - feeding process materials through the crusher and screener to ensure all parts are operating correctly; and
- Ramp up by increasing the throughput of feed material to the nominated design capacity**.**

As commissioning activities are to occur over a two-day period, the department has determined that a specified environmental commissioning phase under the works approval is not required. The mechanical commissioning activities are considered as part of construction activities. The applicant has requested authorisation to undertake time limited operations for up to 180 days.

The duration for the operation of the mobile crushing and screening plants is anticipated to be approximately 18 months. The applicant will be required to apply for a licence under Part V Division 3 of the EP Act to continue operating the mobile crushing and screening plants beyond the requested time limited operations assessed under this works approval.

It is proposed that material for the crushing and screening plants will be sourced from drill and blast waste, borrow pits and from the mining operations in the surrounding area. Material will be stockpiled near the mobile crushers where it will be fed into the jaw crusher via a loader.

Each crushing and screening plant location will be supported by the following:

- Feed material and product stockpiles;
- Jaw crusher and feed ramp;
- 2 x mobile cone crushers;
- 2 x diesel fuelled generators;
- Fuel within self-bunded storage tanks;
- Potable and raw water tanks;
- A loader;
- A dedicated water cart with a holding capacity of up to 121 kilolitres (kL);
- A heavy vehicle;
- Excavator; and
- Five dump trucks.

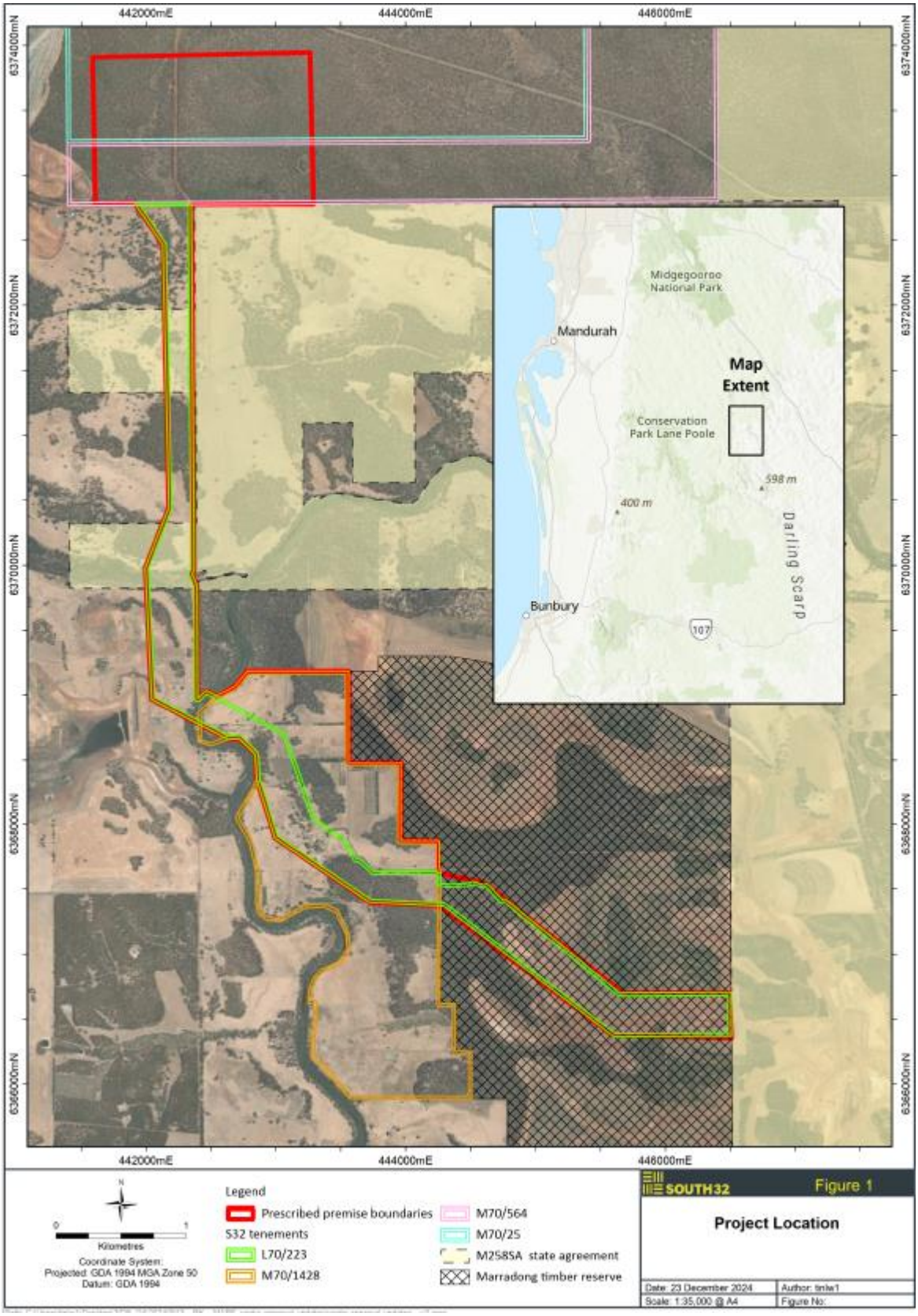

Figure 1: Prescribed premises location and boundary (sourced from South32 2023)

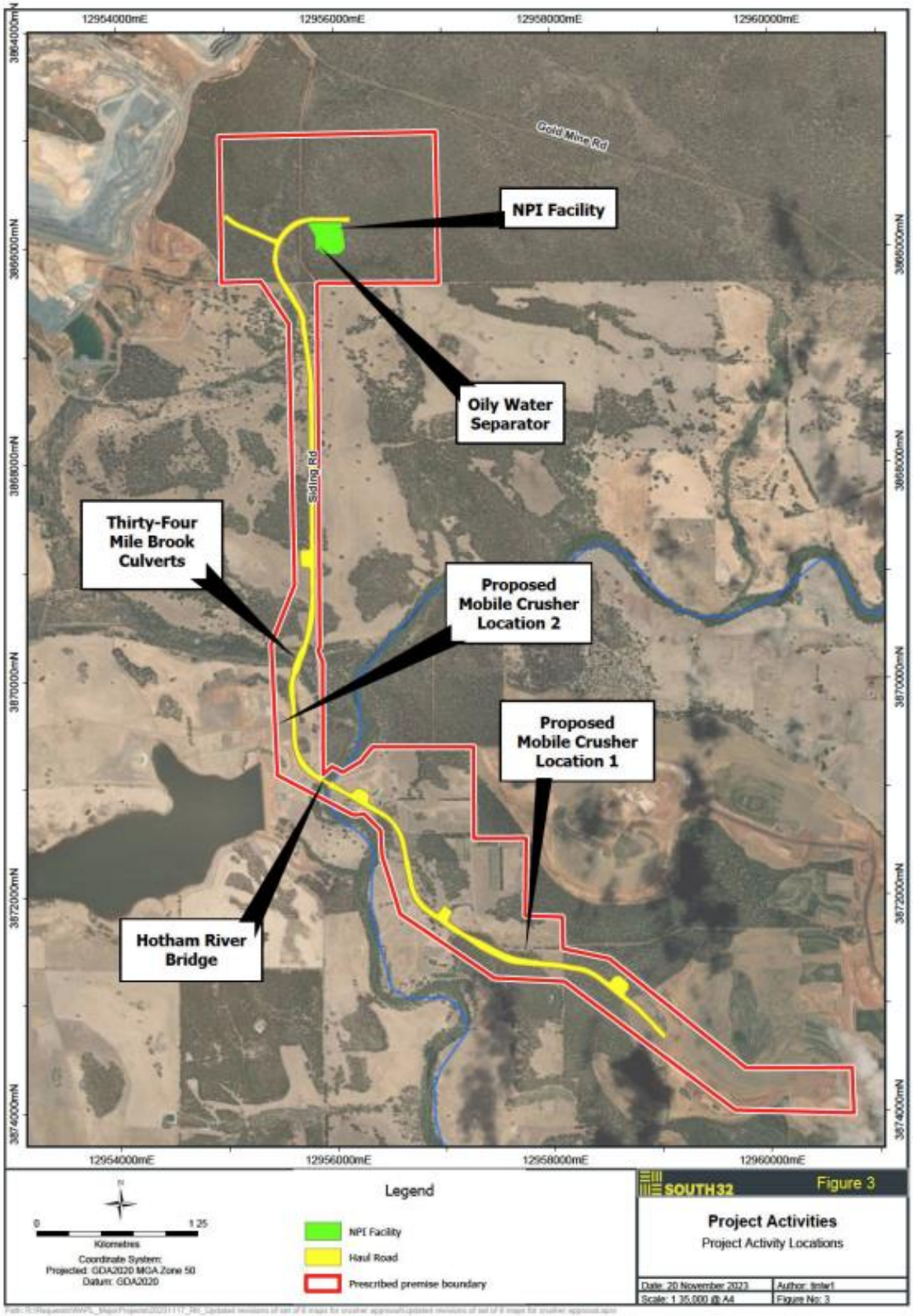

Figure 2: Crushing and screening plant and oily water separator locations (sourced from South32 2023)

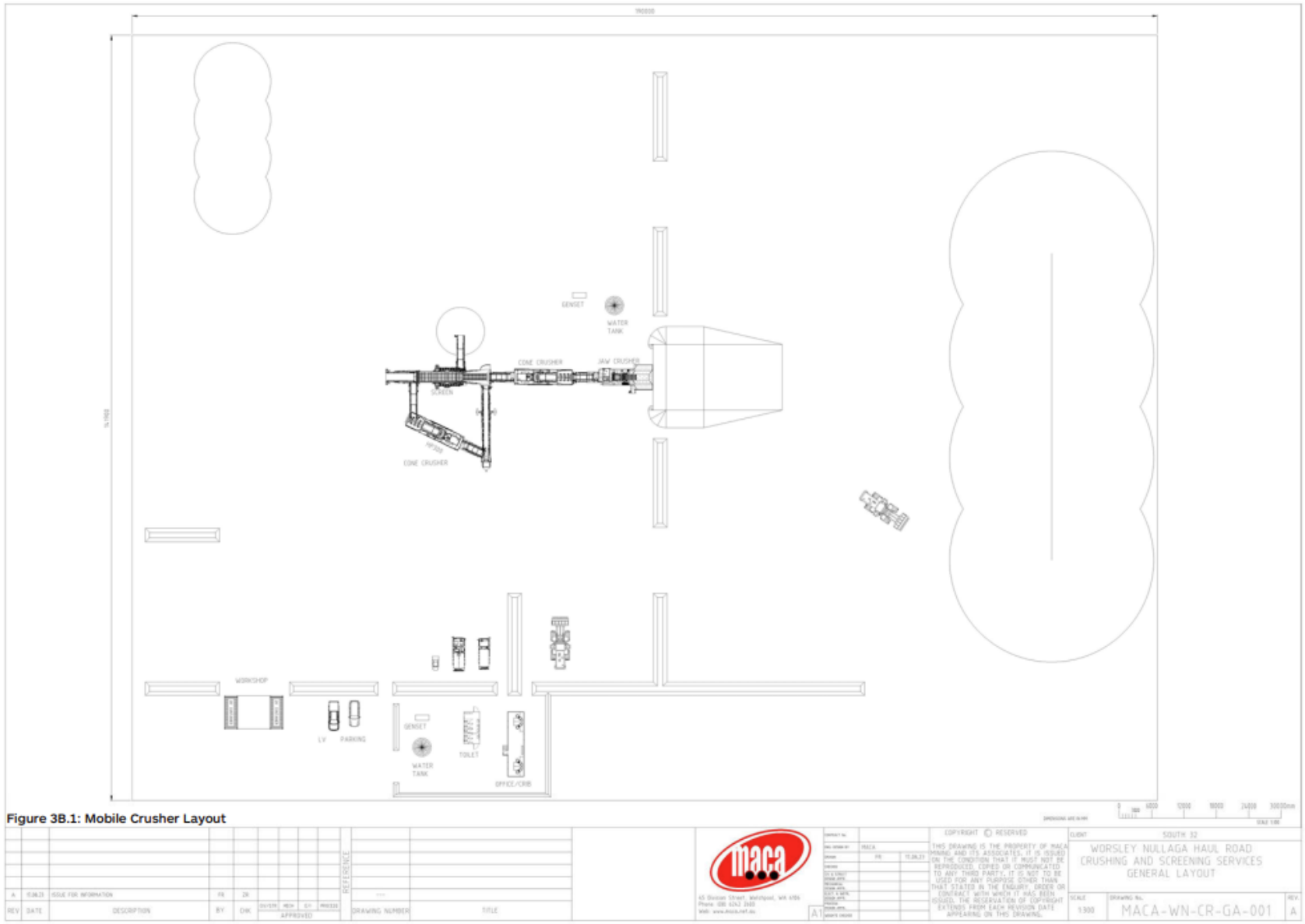

Figure 3B.1: Mobile Crusher Layout

Figure 3: General layout of the crushing and screening plant and associated infrastructure (sourced from South32 2023)

2.2.2 Oily water separator

The applicant has also applied for the construction and time limited operation of an OWS with a treatable flowrate of 5 L/s. The Delegated Officer considers that the OWS is directly related to the crushing and screening operations and has included it within the risk assessment (Table 3).

The OWS will be located within the non-production infrastructure (NPI) facility (Figure 2 and Figure 4), situated within the bulk fuel storage area. Bulk fuel storage will be licensed under the *Dangerous Goods Safety (Storage and Handling of Non-Explosive) Regulations 2007*. The quantity of fuel stored does not meet the design/production capacity for prescribed premises category 73: Bulk storage of chemicals etc., specified under Schedule 1 of the EP Regulations, and has therefore not been assessed under works approval W6887/2024/1.

The OWS will receive wastewater generated from the two proposed concrete hardstands/compacted, lined earth pad used for the unloading of fuel and the refuelling of light and heavy vehicles. Figure 5 provides the process flow of the wastewater generated from the two hardstands/compacted, lined earth pad through the OWS, where the treated wastewater is used for dust suppression. A summary of the wastewater treatment process is presented below:

- Concrete hardstands/compacted, lined earth pad will have a drainage line leading to a draining sump to collect the wastewater;
- An above ground pipe will transport the wastewater to the OWS;
- The OWS will have a full retention separator to separate the waste oil and water;
- The treated water will be drained via gravity to a High-Density Polyethylene (HDPE) lined evaporation pond;
- Unevaporated treated water will be tested to ensure it meets the department's *Water quality protection note 68: Mechanical equipment wash down* (DoW 2013). Concentrations of total petroleum hydrocarbons (TPH) must not exceed 15 mg/L and total benzene, toluene, ethyl benzene and xylene (BTEX) must not exceed a cumulative value of 0.1 mg/L;
- The treated water will be pumped to a standpipe facility with a holding capacity of 2,800 kL, where the treated water will be diluted with groundwater for dust suppression; and
- The separated waste oil will be stored within the OWS, which will be siphoned every three to four years, and disposed of at an appropriately licensed waste facility.

Clearing of native vegetation will be required to construct the NPI facility. The assessment for the clearing of native vegetation is not included in this decision report and will be assessed by the EPA under Part IV of the EP Act.

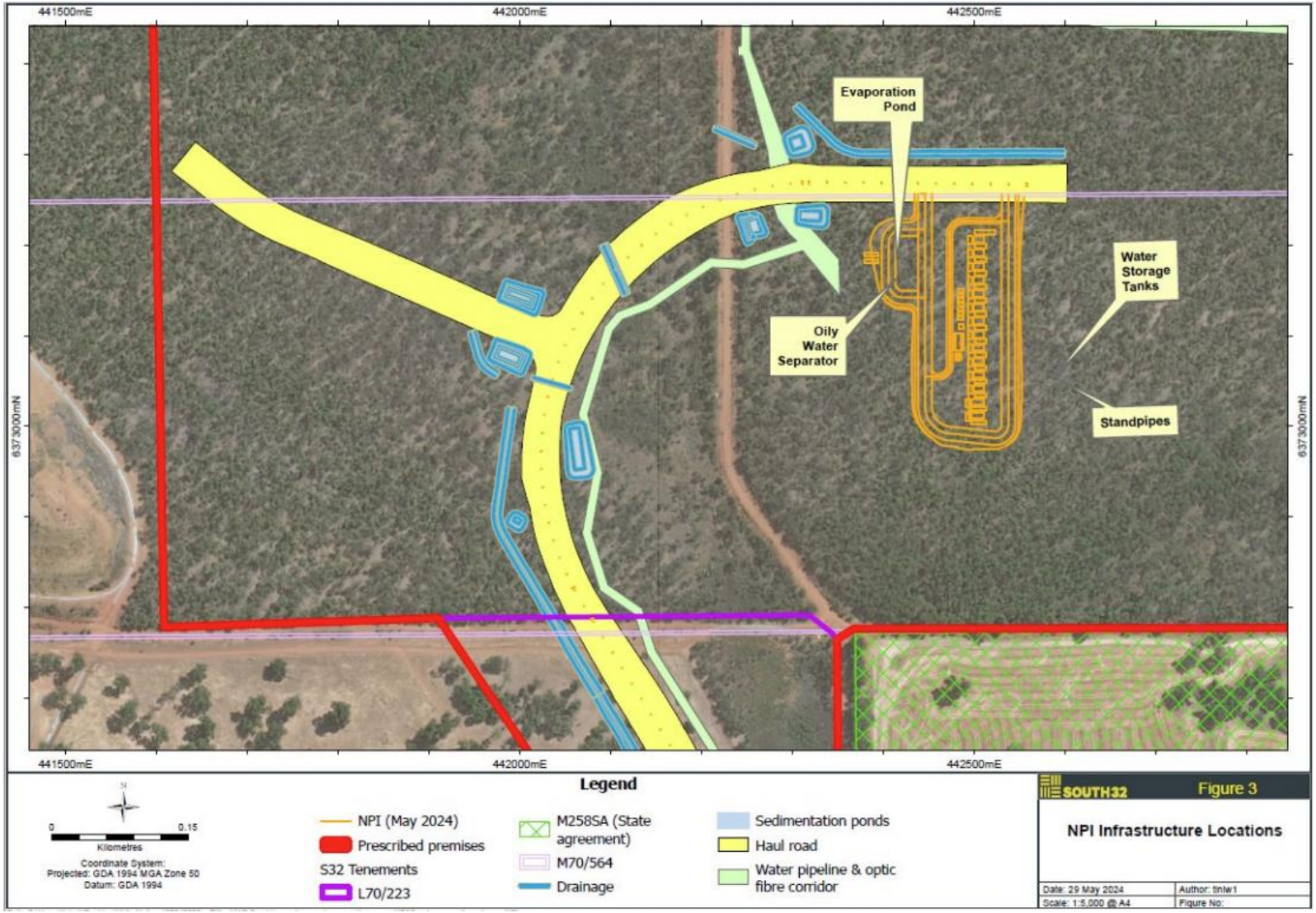

Figure 4: Non-production infrastructure locations (sourced from South32 2024a).

DESCRIPTION / NOTES				TE		E
STREAM NUMBER	1	2	3	4	5	6
DESIGN FLOW (m^3/h)	*	*	*	*	*	*
MAXIMUM FLOW (m^3/h)	*	*	*	*	*	*
DAY RATE (kL/day)	*	*	*	*	*	*

GENERAL NOTES

1. PAD SIZING TO BE CONFIRMED DURING D&C PHASE.
2. SUMP SIZING TO BE CONFIRMED DURING D&C PHASE.
3. SPILLCEPTOR SPI,006,C1,2C,AG (1300L CONTAINMENT 360 L/m).
4. REFER FUEL DELIVERY PFD D-445-K-20007.
5. FLOWRATES, PUMP, POND, AND OILY WATER SYSTEM SIZING TO BE CONFIRMED DURING D&C DEVELOPMENT.

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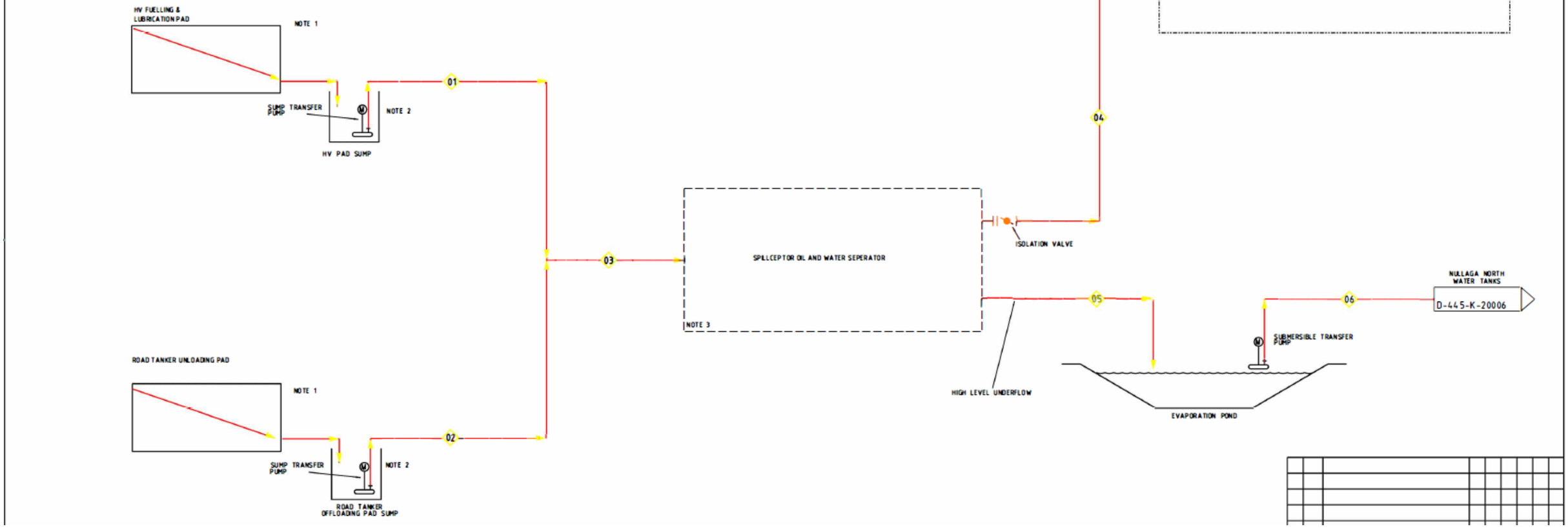

Figure 5: Oily water separator process flow (provided by South32).

2.3 Part IV of the EP Act

2.3.1 Ministerial Statement

On 14 August 2020, the applicant submitted to the EPA (Assessment Number 2216), a proposal involving a significant amendment to authorise an expansion to mining operations north of Marradong into the Nullaga area (i.e., the Nullaga Mine Expansion Project). The key environmental factors considered by the EPA included: flora and vegetation, terrestrial fauna, inland waters, terrestrial environmental quality, greenhouse gas emissions, social surroundings, and air quality.

On 8 July 2024, the EPA Report 1768 (EPA 2024b) and proposed conditions were published and made available on the EPA's website for appeal. A total of 134 appeals were lodged against the EPA Report and its recommendations. A determination on the appeals (Appeal Number 040 of 2024) was made on 12 December 2024.

Ministerial statement (MS1237) was granted on 20 December 2024, which the applicant now currently operates the mining, transport and processing of bauxite. The department has reviewed the newly granted ministerial statement to ensure that no works approval conditions contradict with the current ministerial statement.

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 2020b).

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 premises construction and operation 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	Placement of mobile crushing and screening plants and associated equipment including vehicle movements (reversing alarms).	Air / windborne pathway	• Maintain watercart or similar onsite to dampen roads and tracks during mobilisation to minimise dust lift off; • Implement traffic control measures (speed limits) on site to minimise dust generation from vehicle movements; • Visually monitor the activities for dust emissions and temporarily cease works in high dust emission or high wind conditions are observed. If potential impacts are identified, reduced operations and dust controls including water applicable will be implemented; and

Emission	Sources	Potential pathways	Proposed controls
			• Placing the infrastructure on already disturbed and cleared land.
Noise	Placement of mobile crushing and screening plants and associated equipment including vehicle movements (reversing alarms).	Air / windborne pathway	• Implement traffic control measures (speed limits) on site to minimise noise generation from vehicle movements; • Vehicles, machinery and equipment maintenance will be kept up to date; • All vehicles and machinery (where required) will be fitted with broadband non-tonal reversing alarms; and • Construction noise management plan (CNMP) developed for managing noise emissions from premises (refer to section 3.3).
Operation *(time limited)*			
Dust	Crushing and screening of material, handling of material, vehicle movements, lift-off from stockpiles and/or stored product, etc.	Air / windborne pathway.	• Works will be limited during high wind conditions, if potential impacts are identified reduced operations and mitigation actions such as dust suppression through water application will occur; • Both crushing and screening areas will have dust management control infrastructure in the form of reticulated mist sprays on conveyors and material transfer points; • A watercart will be used to precondition feed materials to control the dust around the crusher pad and during the crushing process; • A 50 kL water tank will be located near the crushing and screening plants installed for the purpose of supplying water for dust suppression; • Identified personnel involved will undergo dust management and awareness training; • Prescribed premises boundary is approximately 2.5 km from the closest sensitive receptor; and • Visually monitor the activities for dust emissions and temporarily cease works if high dust emissions observed followed by dampening of cleared areas by watercarts to occur prior to works recommencing.

Noise	Crushing and screening of material, handling of material, vehicle movements (including reversing alarms)	Air / windborne pathway.	• Regular maintenance in accordance with manufacturer's specifications on the crushing and screening plants;
			• Identified personnel involved will undergo noise management and awareness training;
			• Noise modelling indicates that mobile crushing and screening activities will comply with the Noise Regulations. Construction noise management plan (CNMP) developed (refer to section 3.3).
			• Plant and infrastructure regulatory maintained and checked to ensure they are not generating excessive noise;
			• Plant to be throttled down or shutdown when not in use;
			• Compression breaks on trucks will be reduced as far as practicable;
			• All engine and enclosure panels will be kept closed.
			• Any noisy works will be undertaken during less sensitive periods, and where possible, move away from sensitive receptors during nighttime operations.
			• The number of individual plants/equipment that are operational during out of hours, will be kept to the minimum required for the task.
			• Noise levels of plants and equipment will have operating sound power levels equal to or below those specified in the CNMP:
			  ○ Mobile crusher – 108 dB(A);
			  ○ Mobile screen – 107 dB(A);
			  ○ Front end loader – 109 dB(A).
			• Simultaneous operation of noisy plant within discernible range of a sensitive receptor will be avoided, and the offset distance maximised.
			• Vehicles, machinery and equipment maintenance will be kept up to date;
			• All vehicles and machinery (where required) will be fitted with broadband non-tonal reversing beepers.
			• Structures will used to shield sensitive receptors from noise emissions, where practicable.
			• Verification noise monitoring will be undertaken to confirm sound power levels and update the noise model in the CNMP accordingly.
			• Verification noise monitoring will be undertaken in the vicinity of receptor R7 during pre-construction, during high-noise activities (e.g., piling), and during worst case works scenario to assess whether tonal penalty applies.
			• Attended noise monitoring will be undertaken in the event of a noise complaint.

Emission	Sources	Potential pathways	Proposed controls
Sediment laden stormwater runoff	Excess water used for dust control during all onsite activity including stockpile dust management and large rainfalls resulting in stormwater.	Excess water runoff.	No controls provided
Hydrocarbons and Potentially contaminated (hydrocarbon) stormwater runoff.	Operation of mobile plant or vehicles on the premises. Fuel storage associated with plants.	Direct discharge, runoff or infiltration from spills or leaks caused by infrastructure failure, spilling or overflowing.	Fuel storage tanks will be self-bunded.
	Operation of the OWS and Evaporation Pond.		• Concrete hardstands/compacted, lined earth pad washed down after use or rainfall events and diesel spills; • Concrete sump consisting of 5 kL capacity; • Pumps that lead from the sump to the OWS will have float valves installed to prevent overflowing of the 5 kL concrete sump; • OWS sized to retain a total of 50 kL of oily water between the three tanks. (more than three hours of containment during heavy rain events with a 2% annual exceedance probability); • Oil removed every three to four years and disposed at an appropriate licensed waste facility; • Visual inspections will be undertaken during rain events to ensure no overflow of the waste oil or treated water. If high levels are identified a removal truck will be called in to removed wastewater prior to overflow; • Monthly testing in the evaporation pond to confirm that treated water is below the DoW (2013) indicative wastewater discharge criteria thresholds for TPH of 15 mg/L and total BTEX of 0.01 mg/L; • Treated water will be diluted at the standpipe with groundwater to dilute prior to use as dust suppression; and • 2 mm thick HDPE lined evaporation pond.

Emission	Sources	Potential pathways	Proposed controls
Hydrocarbons and Potentially contaminated (hydrocarbon) stormwater runoff.	Operation of mobile plant or vehicles on the premises. Fuel storage associated with plants.	Attraction followed by fauna ingestion of contaminated water.	• Installation of security fencing around the toe of the pond; and • Security fencing around the wider mining area once operational.

3.1.2 Receptors

In accordance with the *Guideline: Risk Assessment* (DWER 2020b), 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 provides a summary of potential human receptors (Figure 6) 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 2020a)). Distances provided in Table 2 are from the proposed prescribed premises boundary. As previously mentioned in section 2.2, the applicant plans to relocate the crushing and screening plants throughout the prescribed premises during operations to reduce haulage of material throughout the premises. Measuring distances to receptors from the boundary of the premises is conservative as the main two locations of the crushers will be even further away from receptors (see Figure 6), providing an additional buffer between emission sources and sensitive receptors.

The nearest town is the town of Boddington which is located approximately 5.5 km east of the proposed premises boundary. The EPA's Guidance for the *Assessment of Environmental Factors: Separation Distances between Industrial and Sensitive Land Uses* (2005) recommends a separation distance between sensitive human receptors and 'screening works' or 'extractive industries' (which include the crushing and screening of hard rock, sand and limestone) to be between 300 and 1,000 meters to provide a sufficient buffer for emissions of noise and dust emissions. Table 2 below shows that all human receptors are located greater than the recommended distance from the proposed premises boundary.

Table 2: Sensitive human and environmental receptors and distance from prescribed premises boundary

Human receptors	Distance from prescribed premises boundary
Residential receptors (Figure 6)	The closest human receptors (R7 and R9) are located approximately 2.5 km west and northeast of the premises boundary (Figure 6). The next closest human receptor is 2.9 km east (R5) of the premises boundary. The closest human receptor to either of the initial crusher locations is approximately 2.7 km south of crusher 1 (R8) and 2.7 km south-west of crusher 2 (R7). Receptor R6 been identified as part of the Boddington Tip and is not assessed as a sensitive receptor (South32 2024b). Residential dwellings located 840 m south and 950 m south of boundary (not shown in Figure 6) are vacant and the applicant has indicated that they have amenity agreements in place with the owners of these dwellings. As such, these dwellings are not considered as sensitive receptors in the risk assessment.

Environmental receptors	Distance from premises boundary
Threatened and priority fauna	Surveys completed by the applicant have identified potential habitat for the following species in the area of the premises: • *Calyptorhynchus banksii naso* (Forest Red-Tailed Black Cockatoo); • *Zanda latirostris* (Carnaby's Cockatoo); • *Zanda baudinii* (Baudin's Cockatoo); • *Bettongia penicillate* (Woylie); • *Myrmecobius fasciatus* (Numbat); and • *Dasyurus geoffroii* (Chuditch). Sitings of vulnerable, endangered, priority and conservation dependent bird and mammal species have been sighted within the proposed prescribed premises and/or within 500 m of the premises boundary. Sitings have been recorded between from 2001 to 2017.
Environmental receptors	**Distance from premises boundary**
Native vegetation	• Native vegetation surrounds adjacently to the northern portion of the prescribed premises boundary to the west, north and east. • Native vegetation is present adjacent to the premises boundary to the east where Mobile Crusher 2 will be initially located. • Native vegetation is present adjacent to the premises boundary to the northeast and south where Mobile Crusher 1 will be initially located. • Native vegetation is also located immediately north and east of the proposed construction laydown area and borrow.
Threatened and priority flora	Priority 1: *Gastrolobium sp.* identified at the central and southern portions of the Project area approximately 30 m east from the proposed prescribed premises boundary.
Priority Ecological Communities (PECs**)**	Two PEC *Eucalypt Woodlands of the Western Australian Wheatbelt* (DBCA-038) occurs within the Project Area and adjacent to the proposed prescribed Premises boundary.
Surface water bodies	The Hotham Farm Dam is located approximately 220 m west of the proposed prescribed premises boundary. The Thirty-Four Mile Brook intersects the premises and proposed haul road and then flows into the Hotham River. The brook is located approximately 220 m north-east of the initial location of Mobile Crusher 2 and 3.2 km south of the proposed OWS. The Hotham River intersects the proposed premises once along the proposed haul road and is located approximately 320 m northeast of the proposed mobile crusher 2 initial location. The Hotham River is also classified as a registered Aboriginal heritage site.
Groundwater	Groundwater in the area ranges from fresh to highly saline (The Applicant has recoded TDS at 10 – 12,000 mg/L) and ranges in depth from 15 to 40 mbgl. The premises is not within any proclaimed or priority drinking water areas.

Heritage receptors	Distance from prescribed activity
Hotham River – Mythological – OBJECTID 24044 *Status – Registered site*	River intersects the proposed Premises once along the proposed haul road and is located approximately 320 m northeast of the proposed mobile crusher 2 initial location.
Worslet Timber 3 – Artefacts / Scatter – OBJECTID 4126. *Status – Historic*	Located within the proposed prescribed premises approximately 330 m north from the mobile crusher 2 initial location. **Assessed by the Department of Planning, Lands and Heritage (DPLH) as not meeting Section 5 of the *Aboriginal Heritage Act 1972* (AH Act) and has therefore been screened out as a receptor.**
Boddington Forrest 10 – Artefacts / Scatter – OBJECTID 5460. *Status - Stored data / Not a site*	Located within the northern portion of the proposed prescribed premises approximately 200 m northeast from the proposed OWS location. **Assessed by DPLH as not meeting Section 5 of the AH Act and has therefore been screened out as a receptor.**
Boddington Forrest 12 – Artefacts / Scatter – OBJECTID 5463. *Status - Stored data / Not a site*	Located within the northern portion of the proposed prescribed premises approximately 340 m northwest from the proposed OWS location. **Assessed by DPLH as not meeting Section 5 of the AH Act and has therefore been screened out as a receptor.**
Boddington Forrest 13 – Artefacts / Scatter – OBJECTID 5464. *Status - Stored data / Not a site*	Located within the northern portion of the proposed prescribed premises approximately 370 m west from the proposed OWS location. **Assessed by DPLH as not meeting Section 5 of the AH Act and has therefore been screened out as a receptor.**

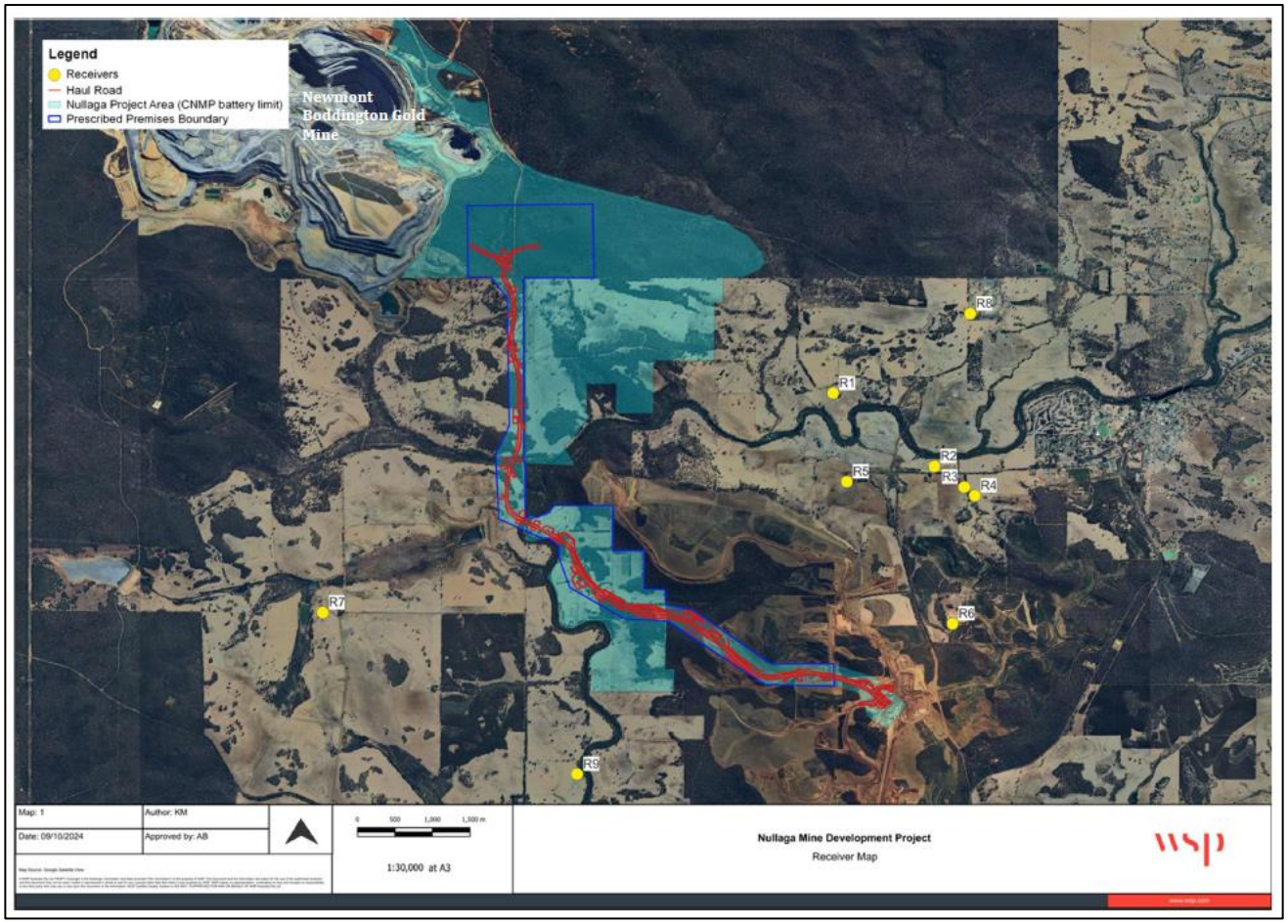

Figure 6: Location of sensitive receptors (Sourced from South32 2024b)

3.1.3 Meteorology

Meteorology data was sourced from the Bureau of Meteorology (BoM) website (BoM 2024). The closest monitoring location which records wind strength and direction is the Wandering weather station (site number 010917). The weather station is located approximately 30 km northeast of the prescribed premises boundary.

The average monthly wind speed recorded at 9am and 3pm from the monitoring station is presented in Figure 7. Wind speed appears to be greater in the afternoon (3pm) than the morning (9am) and average wind speed was recorded higher during the summer months (December to January) when compared with the winter months (June to August).

Figure 8 presents wind roses illustrating the average annual wind direction and speed recorded at 9am and 3pm from December 1998 to 10 August 2024 at the monitoring station. Each branch of the rose represents wind coming from that direction, with north at the top of the diagram. Wind speed is represented by the colour as shown in Figure 8. The length of each segment shows how often the wind was blowing from that direction and at that speed.

The wind roses (Figure 8) indicate that on an annual average the highest wind speeds recorded at 9am generally blows from the north and southeast direction while at 3pm wind strength is greatest from the southeast and northwest followed closely by wind coming from the west and south.

The closest sensitive receptors to the premises are located to the east, south and west of the premises (Figure 6). Figure 8 indicates that receptor R8 to the south is likely to receive prevailing winds from the direction of the premises during the morning period (9am). It is noted that readings in the afternoon (3pm) indicate that there is no clear prevailing wind direction although, wind direction from the southeast, northwest, west and south appear to occur the majority of the time when compared with

other cardinal directions. As such, sensitive receptors to the east of the prescribed premises have a likelihood to experience prevailing winds from the premises during the afternoon (3pm).

Using information presented in Figure 7 and Figure 8 the following observations and statements have been recognised:

- Sensitive receptors to the east (R1 to R5) are more likely to experience a prevailing wind from the premises between September to March in the afternoon (3pm); and
- The sensitive receptors to the south and west (R8 and R7) are more likely to experience a prevailing wind from the premises between November to February in the morning (9am).

It is important to note that these wind roses show historical windspeed and historical wind direction data for the Wandering weather station and should not be used to predict future data, this data is presented to provide a general assumption and indication of future wind patterns.

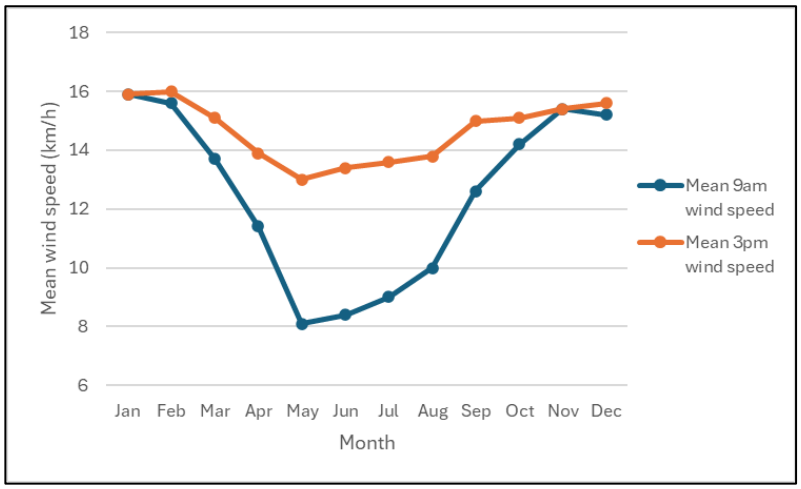

Figure 7: Average monthly wind speeds recorded at Wandering weather station (site number: 010917) from 1998 to 2010 (Sourced from BoM 2024).

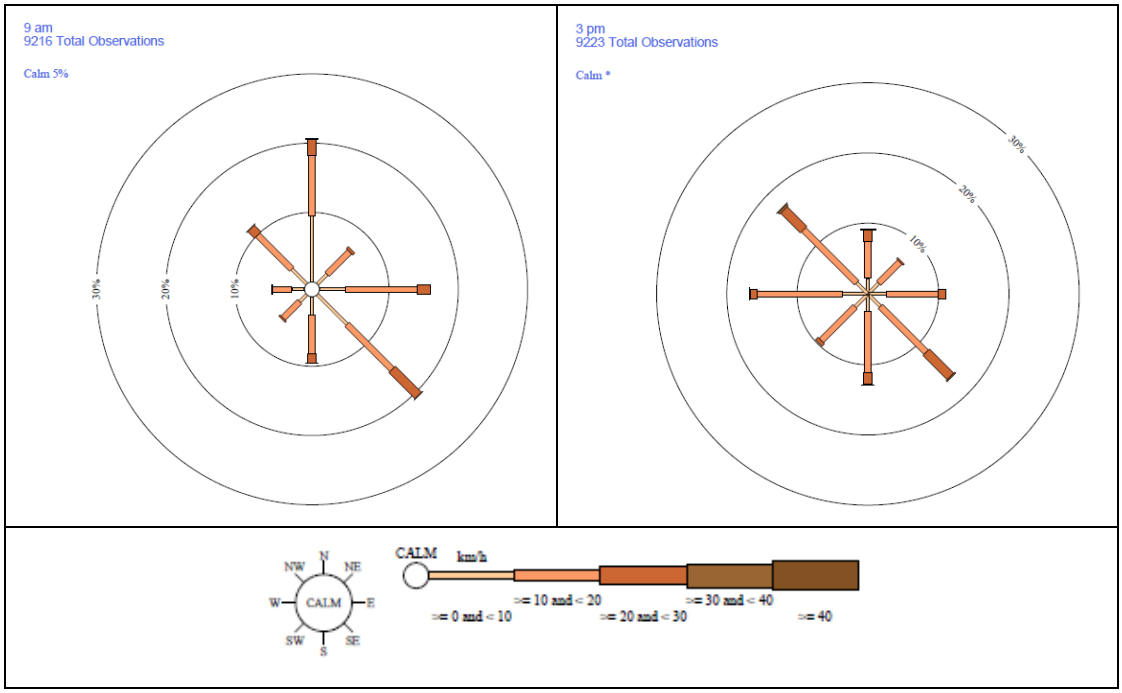

Figure 8: Wind rose plots, average annual 9am (left) and 3pm (right) from the Wandering weather station (Sourced from BoM 2024). *Note: asterisk (*) indicates that calm is less than 0.5 %.*

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020b) 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 W6887/2024/1 that accompanies this decision report authorises construction and time limited operation. 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 TLO phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises i.e. category 12 crushing activities. 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 and time limited operation

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Comments / justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Construction								
Placement of crushing and screening plant and associated equipment including vehicle movements (reversing alarms). and Construction of the OWS.	Dust	**Potential Pathway:** Dust generated via activity being transported offsite with aid by wind to the receptor. **Potential Impacts:** Deposition of dust resulting in reduced vegetation health or stress, impacting fauna habitats. Reduced water quality from particulate matter deposition.	• **Native vegetation (including PEC and Priority Flora)** (adjacent to premises boundary) • **Threatened and priority fauna** (sighted within and surrounding premises) • **Thirty-Four Mile Brook** (intercepts through the premises) • **Hotham River** (intercepts through the premises)	Refer to section 3.1.1	C = Slight L = Unlikely **Low Risk**	Y	Condition 1: Water truck requirement during construction	Minimal dust emissions are expected during the construction/installation of the mobile crushing and screening plants and OWS. Works are expected to only occur for a short time period (seven days) and do not involve significant dust generating activities (vehicle movement, placement of infrastructure, minor earthworks). The applicant's proposed controls for managing dust generated during the construction phase have been deemed to be sufficient for managing dust emissions. In addition, the distance to residential receptors from dust sources (greater than 2.5 km) means it is unlikely that impacts from dust emissions on human health or amenity will occur during the construction phase. The department has determined that additional regulatory controls are not required to manage this risk event.
		Potential Pathway: Dust generated via activity being transported offsite with aid by wind to the receptor. **Potential Impacts:** Impacts to public health or amenity from dust emissions.	**Residential receptors** (closest being 2.5 km from premises boundary, 2.7 km from crusher locations)			Y		
	Noise	**Potential Pathway:** Noise generated via activity being transported offsite with aid by wind to the receptor. **Potential Impacts:** Reduction in amenity.	**Residential receptors** (closest being 2.5 km from premises boundary, 2.7 km from initial crusher locations)		C = Minor L = Unlikely **Medium Risk**	Y	N/A	Minimal offsite impacts to amenity from noise emissions are expected during the construction/ installation of the mobile crushing and screening plants and OWS due to the distance to sensitive receptors (greater than 2.5 km). Works also do not involve significant noise generating activities (vehicle movement, placement of infrastructure, minor earthworks) and therefore it is unlikely that amenity impacts will occur during the construction phase. The department has determined that additional regulatory controls are not required to manage this risk event.

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Comments / justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Operation (including TLO)								
Operation of crushing and screening plants involving crushing, unloading, loading and stockpiling of material, and vehicle movements.	Dust	**Potential Pathway:** Dust generated via activity being transported offsite with aid by wind to the receptor. **Potential Impacts:** Deposition of dust resulting in reduced vegetation health or stress, impacting fauna habitats, and reduction in water quality.	• **Native vegetation (including PEC and Priority Flora)** (adjacent to premises boundary) • **Threatened and priority fauna** (sighted within and surrounding premises) • **Thirty-Four Mile Brook** (intercepts through the premises) • **Hotham River** (intercepts through the premises)	Refer to section 3.1.1	C = Moderate L = Unlikely **Medium Risk**	Y	Condition 1: Dust suppression requirements for mobile crushing and screening plant Condition 6: Dust suppression requirements during crushing and screening operations Condition 7: Dust management requirement	The applicant has proposed several measures to minimise dust emissions generated from the crushing and screening activity, such as water sprays installed at conveyors and material transfer points and the use of a water cart to precondition feed materials to control dust around the mobile crusher pad and during the crusher process. The department has determined that these controls are acceptable and should be sufficient to manage the risk of potential impacts to environmental receptors from dust emissions emitted during plant commissioning and TLO. The applicant's proposed controls have been conditioned within the works approval in accordance with the department's *Guideline: Risk Assessment* (2020b). The department has determined that additional regulatory controls are not required to manage this risk event.
		Potential Pathway: Dust generated via activity being transported offsite with aid by wind to the receptor. **Potential Impacts:** Impacts to public health or amenity from dust emissions.	**Residential receptors** (closest being 2.5 km from premises boundary, 2.7 km from initial crusher locations)	Refer to section 3.1.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 1: Dust suppression requirements for mobile crushing and screening plant Condition 6: Dust suppression requirements during crushing and screening operations Condition 7: Dust management requirement	It is expected that the crushing and screening plants will have a maximum throughput of 350,000 tonnes per annum each (operating at approximately 250 tonnes per hour). Due to the applicant's intention to remobilise the crushing and screening plants to different locations throughout the prescribed premises boundary, the distances to human receptors were measured from the closest boundary of the premises. This is a conservative approach as the distance between the crushing plants and human receptors is likely to be greater than from the premises boundary (~2.7 km). The separation distance between the boundary of the proposed prescribed premises and the closest human (residential) receptor is 2.5 km. This distance is greater than the distance recommended by the EPA's *Guidance for the Assessment of Environmental Factors: Separation Distances between Industrial and Sensitive Land Uses* (2005), which recommends a separation distance between 300 – 1000 m between similar activities (such as 'screening works' or 'extractive industries' (which include the crushing and screening of hard rock, sand and limestone) and human receptors. The department has determined that these controls are acceptable and should be sufficient to manage the risk of potential impacts to environmental receptors from dust emissions emitted during plant commissioning and TLO. The applicant's proposed controls have been conditioned within the works approval in accordance with the department's *Guideline: Risk Assessment* (2020b). The department has determined that additional regulatory controls are not required to manage this risk event.

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Comments / justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Operation of crushing and screening plants involving crushing, unloading, loading and stockpiling of material, and vehicle movements (including reversing alarms)	Noise	**Potential pathway:** Noise generated via crushing and screening activity being transported offsite with aid by wind to the receptor. **Potential impacts:** Emissions causing disruption to receptors and/or the reduction of site amenity.	**Residential receptors** (closest being 2.5 km from premises boundary, 2.7 km from initial crusher locations)	Refer to section 3.1.1	C = Moderate L = Unlikely **Medium Risk** Refer to section 3.3.	N	Condition 1: Sound power level requirement for mobile crushing and screening plant Condition 6: Noise mitigation requirement for vehicles and mobile machinery **Condition 11 to 14: Noise verification monitoring requirements during time limited operation of mobile crushing and screening plants**	Refer to section 3.3.
Operation of crushing and screening plants involving crushing, unloading, loading and stockpiling of material, and vehicle movements	Sediment laden stormwater	**Potential pathway:** Stormwater runoff from stockpiles (feed and crushed material) carrying sediment offsite. **Potential impacts:** Disruption of fauna habitats, waterways and native vegetation through the addition of extra sediment potentially transported in stormwater.	• **Native vegetation (including PEC and Priority Flora)** (adjacent to premises boundary) • **Threatened and priority fauna** (sighted within and surrounding premises) • **Thirty-Four Mile Brook** (intercepts through the premises) • **Hotham River** (intercepts through the premises)	Refer to section 3.1.1	C = Minor L = Possible **Medium Risk**	N	**Condition 1: Construction requirement for stormwater management infrastructure** **Condition 6: Operation and maintenance of stormwater management infrastructure.**	The applicant did not propose any controls to manage sediment laden stormwater that may be generated during rainfall events from stockpiling of material (for feed or post crushing) and operation of the crushing and screening plant. The department has determined that additional regulatory controls are required to adequately manage the risk of potential impacts to environmental receptors from sediment laden stormwater emitted during plant commissioning and TLO. Consequently, conditions 1 and 6 require the applicant to construct, operate, and maintain stormwater management infrastructure to divert clean stormwater away from the operational areas, as well as capture contaminated and potentially contaminated stormwater within the operational area.
	Hydrocarbons	**Potential pathway:** Spills or leaks from mobile plants or vehicles resulting in direct discharge to land and infiltration to groundwater. **Potential Impacts:** Contamination or environmental damage to receptors, impacting fauna habitats.	• **Native vegetation** (adjacent to premises boundary) • **Threatened and priority fauna** (sighted within and surrounding premises) • **Localised soils** • **Thirty-Four Mile Brook** (intercepts through the premises) • **Hotham River** (intercepts through	Refer to section 3.1.1	C = Slight L = Unlikely **Low Risk**	N/A	N/A	General provisions of the EP Act apply, and the *Environmental Protection (Unauthorised discharge) Regulations* 2004 adequately regulate this risk event. No additional regulatory controls (in the form of conditions under this works approval) are required.

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Comments / justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
			the premises) • **Groundwater**					
Operation of OWS (bulk fuel storage area) and evaporation pond.	Hydrocarbons	**Potential Pathway:** Spills or leaks from pipelines or OWS, overtopping of the evaporation pond, or infiltration through sides and base of ponds resulting in a direct discharge to land, runoff, and infiltration to groundwater. **Potential impacts:** Contamination or environmental damage to receptors, impacting fauna habitats	• **Native vegetation** (adjacent to premises boundary) • **Threatened and priority fauna** (sighted within and surrounding premises) • **Localised soils** • **Groundwater** • **Thirty-Four Mile Brook** (intercepts through the premises) • **Hotham River** (intercepts through the premises)	Refer to section 3.1.1	C = Minor L = Unlikely **Medium Risk**	N	Condition 1: Construction requirements for OWS, hardstand/compacted, lined earthen pad, sumps, and evaporation pond Condition 1: **Lined earth pad to meet a minimum permeability of a 1 x 10^{-9} m/s** **Condition 6:** Maintenance of OWS, float valves, sumps, fencing, and evaporation pond (including **freeboard requirement**) **Condition 8: Inspection requirements during time limited operation**	The applicant has proposed several measures to manage potential emissions relating to hydrocarbons from the operation of the OWS and evaporation pond at the NPI facility. The department has determined that additional regulatory controls are required to adequately manage the risk of potential impacts to environmental receptors from hydrocarbon spills and leaks during plant commissioning and TLO. The applicant's proposed controls have been conditioned within the works approval in accordance with the department's *Guideline: Risk Assessment* (2020b). In addition, conditions 6 and 8 also require the applicant to maintain a freeboard of at least 300 mm at the evaporation pond and perform routine inspections (at the OWS, evaporation pond, and associated pipelines), respectively. The freeboard and inspection requirements have been included to ensure the risk of overtopping at the evaporation pond is adequately managed. The frequency of the inspections required was determined in accordance with recommendations specified in the *Water quality protection note 68: Mechanical equipment wash down* (DoW 2013). The department has included an additional regulatory requirement to require the lined earthen pad (if constructed) under hydrocarbon storage and refuelling facilities where there is a potential for hydrocarbon spills to achieve a minimum permeability of 1 x 10^{-9} m/s. This permeability is deemed necessary to reduce potential impacts to receptors from hydrocarbons.
		Potential Pathway: Consumption of hydrocarbon impacted evaporation pond water from the evaporation pond **Potential impacts:** Reduction in health or potentially fatal to receptors.	• **Native fauna** (within/adjacent to premises boundary) • **Priority and threatened fauna** (within the premises boundary)		C = Minor L = Rare **Low Risk**	Y	Condition 1: Fencing construction requirements around evaporation pond Condition 6: Fencing maintenance requirements around evaporation pond	The applicant has proposed fencing as measure to minimise the risk of native fauna (including priority and threatened fauna) potentially accessing potentially impacted water being stored at the evaporation pond. The department has determined that these controls are acceptable and should be sufficient to manage the risk of potential impacts to environmental receptors from potentially impacted water generated during plant commissioning and TLO. The applicant's proposed controls have been conditioned within the works approval in accordance with the department's *Guideline: Risk Assessment* (2020b). The department further notes that operational noise emitted from the NPI facility will likely dissuade surrounding fauna from entering the evaporation pond area, reducing the likelihood of this risk event. The department has determined that additional regulatory controls are not required to manage this risk event.
		Potential Pathway: Use of water from bulk fuel storage area OWS for	• **Native vegetation** (adjacent to premises boundary)	Refer to section 3.1.1	C = Minor L = Unlikely **Medium Risk**	Y	**Condition 10: Water quality monitoring requirements for evaporation pond and**	The applicant has proposed several measures to minimise the risk of potential impacts associated with the use of washdown and process water for dust suppression, such as treating the water through an OWS and undertaking routine water quality monitoring.

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Comments / justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
		dust suppression **Potential impacts:** Reduction in health of vegetation and water if dust suppression water contains hydrocarbons, impacts to fauna habitats, reduction in water quality.	• **Threatened and priority fauna** (sighted within and surrounding premises) • **Localised soils** • **Groundwater** • **Thirty-Four Mile Brook** (intercepts through the premises) • **Hotham River** (intercepts through the premises)				**limits for relevant monitoring parameters**	The department has determined that additional regulatory requirements are necessary for the proposed monitoring program to adequately manage the risk of potential impacts to environmental receptors from potentially impacted water generated during plant commissioning and TLO. The applicant's proposed controls have been conditioned within the works approval in accordance with the department's *Guideline: Risk Assessment* (2020b). In addition, condition 10 also requires the applicant to undertake monitoring of benzene, toluene, ethylbenzene, and xylene (BTEX), as part of the proposed water quality monitoring program. The department has also specified a limit for the sum of BTEX, in accordance with recommendations specified in the *Water quality protection note 68: Mechanical equipment wash down* (DoW 2013).

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

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

3.3 Detailed risk assessment for noise emissions from crushing and screening activities

3.3.1 Background

The applicant is proposing to operate the two mobile crushing and screening plants seven days a week for 24 hours per day to carry out the construction of a haul road. The estimated operating life of the crushing and screening plants is approximately 18 months. Noise emissions from the operation of the mobile crushing and screening plants is expected to be generated, which have the potential to impact nearby noise sensitive receptors (residential dwellings), particularly outside of daytime hours (0700 to 1900 hours Monday to Saturday).

Figure 6 outlines the location of the nearest noise sensitive receptors and the premises boundary. The closest residential receptor to the initial location of the crushing and screening plants is approximately 2.7 km. Due to the applicant's proposal to remobilise the crushing and screening plants throughout the premises, the closest sensitive receptor may be as close as 2.5 km from the premises boundary. As a conservative approach, the department has applied 2.5 km as the separation distance to the closest sensitive receptor to assess potential impacts from noise emissions. It is however noted that distances between the noise source and receptors will likely be greater than 2.5 km during operations of the crushing and screening plants.

The applicant has developed a Construction Noise Management Plan (CNMP) to support construction of the Nullaga Mine Expansion Project, which forms a portion of the Worsley Mine Expansion (Revised Proposal) (EPA Report 1768). The CNMP applies to the construction of different aspects within the Worsley Mine Expansion (Revised Proposal), including the construction of the proposed haul road (including two river crossings), operation of crushing and screening plants, and development of support infrastructure The scope of this detailed risk assessment is limited to noise emissions associated with the construction and operation of two mobile crushing and screening plants.

The CNMP includes modelling of potential noise emissions from various construction activities. Predicted noise emissions from crushing and screening operations have been reviewed by technical experts within the department to inform this risk assessment.

It is noted that the CNMP was submitted as an addendum to the supporting documentation for this works approval application on 15 November 2024. Consequently, the CNMP was not included in the supporting documentation that was advertised for public comment in February 2024.

3.3.2 Criteria for assessment

Regulation 7 of the *Environmental Protection (Noise) Regulations 2007* (Noise Regulations) specifies that noise emitted from any premises, when received at other premises, must not exceed the relevant assigned level outlined in Regulation 8. Assigned noise levels vary depending on the time and day of the week. However, Regulation 13 of the Noise Regulations makes provision for construction work to be carried out without meeting the relevant assigned level in Regulation 8.

The department has determined that the operation of the crushing and screening plants do not meet the definition of 'construction work', as defined in sub-regulation 13(1) of the Noise Regulations. As such, Regulation 7 applies and the noise emissions from crushing and screening activities will be required to comply with relevant assigned levels under Regulation 8 of the Noise Regulations.

The assigned levels are statistical noise levels over a representative assessment period (RAP). For this project, the applicant had adopted a RAP of 15 minutes as the minimum assessment time. As the proposed activities are expected to be operational for over 10% of the RAP, the

L_{A10} statistical noise criterion was determined to be the most applicable. The relevant assigned levels vary depending on the day and time. However, as crushing and screening activities are expected to be continuous (i.e., 24 hours a day, seven days a week), noise emissions must be able to comply with several assigned levels. The assigned noise levels adopted for this assessment is detailed in Table 4.

Table 4: Assigned levels for noise sensitive receptors

Type of premises receiving noise	Time of day	Assigned level, L_{A10} (dB)
Noise sensitive premises: highly sensitive area	Monday to Saturday: 0700 to 1900 hours	45 + influencing factor
	Sunday and public holidays: 0900 to 1900 hours	40 + influencing factor
	All days: 1900 to 2200 hours	40 + influencing factor
	Monday to Saturday: 2200 to 0700 hours Sunday and public holidays: 2200 to 0900 hours	35 + influencing factor

3.3.3 Environmental noise impact assessment

As part of the CNMP, the applicant has undertaken environmental noise modelling, utilising the SoundPLAN 8.2 Industrial Module. The CONCAWE method was adopted for the noise model to enable the consideration of meteorological conditions in the noise model, under worst case scenario wind conditions (i.e., wind blowing directly from the noise source to the sensitive receptors). Wind speeds of 4 m/s and 3 m/s were adopted for daytime (i.e., 0700 to 1900) and nighttime (i.e., 2000 to 0700) noise modelling, respectively[1].

Up to six scenarios were modelled, with each scenario represented a different component of the construction activities planned for the Nullaga Mine Expansion Project[2]. Scenario 6, simulating the operation of up to four crushing and screening plants, related directly to the assessment of this works approval. Due to the proposal to allow the re-mobilising of crushing and screening plants within the prescribed premises, the noise model was created using the premises boundary as the noise source to address worst case senario for the plant siting location. Scenario 6 included a mobile crusher, mobile screen, and front end loader. Sound power levels and associated spectral data for this equipment was obtained from reference material.

The predicted noise level received at each noise sensitive receptor is presented in Table 5. A contour map of predicted noise level from the premises is also shown in Figure 9. Based on the noise model, operation of the crushing and screening plants is unlikely to exceed the assigned levels at nearby residential receptors R1 to R9 at all times and days of the week. Crushing and

[1] Atmospheric temperature of 20°C and 15°C, as well as Pasquil stability categories of E and F were adopted for daytime and nighttime noise modelling, respectively. Relative humidity was fixed at 50%. Wind directions were oriented such that they blew from the emission source (i.e., crushing and screening plants) to sensitive receptors.

[2] Scenario 1 modelled the operation of the concrete batching plant; Scenario 2 modelled the construction of the Hotham River bridge; Scenario 3 modelled the construction of the haul road; Scenario 4 modelled the conditioning of construction material at borrow pits; Scenario 5 modelled drilling works for water exploration and geotechnical investigation purposes; and Scenario 6 modelled the operation of the crushing and screening plants.

screening activities also appear unlikely to contribute significantly[3] to the noise received at the sensitive receptors, except at receptor R7 during nighttime operations. There is a risk that noise emissions from crushing and screening activities may marginally exceed the assigned level, particularly if the noise is tonal, under worst-case meteorological conditions.

Table 5: Predicted noise levels from crushing and screening activities at sensitive receptors

Receptor[3]	Distance from premises boundary	Assessment criteria, L_A10 (dB)[2]				Predicted noise level, L_{A10} (dB)
		Weekday	Sunday	Evening	Night	
R1	4.1 km	45	40	40	35	16
R2	4.8 km					<5
R3	5.2 km					<5
R4	5.3 km					<5
R5	3.6 km					9
R7	2.8 km[4]					31[1]
R8	5.9 km					<5
R9	2.6 km[4]					28[1]

Note 1: A 5 dB penalty was applied to the predicted noise level for potential intrusive tonal noise.
Note 2: Weekday represented Monday to Saturday from 0700 to 1900 hours; Sunday represented Sunday and public holidays from 0900 to 1900 hours; Evening represented all days from 1900 to 2200 hours; and Night represented Monday to Saturday from 2200 to 0700 hours and Sunday and public holidays from 2200 to 0900 hours.
Note 3: The applicant has identified receptor R6 as the Boddington Tip and does not consider it to be a noise sensitive receptor. Thus, receptor R6 has been excluded from this assessment.
Note 4: The separation distances between the premises boundary and these sensitive receptors appear to be overestimated in the CNMP. Siting analysis undertaken by the department has estimated the distance of the premises boundary to the receptors R7 and R9 as being approximately 2.5 km.

Furthermore, in reviewing the noise model, the sound power levels used for the mobile crusher [107 dB(A)] and mobile screen [108 dB(A)] appear to be more characteristic of smaller models. As such, the predicted noise levels received at the receptors may be underestimated.

The CNMP outlines several measures for managing noise emissions from the operation of the crushing and screening plant, as well as the wider construction activities at the premises. Noise mitigation controls relevant to the crushing and screening activities are detailed in Table 1.

3.3.4 Risk assessment and additional regulatory requirements

It has been determined that the noise emissions from the proposed crushing and screening operations modelling based on four plants in operation and the potential impact on nearby sensitive receptors are likely to meet the relevant assigned noise levels at all nearby sensitive receptors during day-time hours, and all receptors except for receptor R7 during night-time operations. Noise emissions may exceed the assigned level for night-time operation under worst-case meteorological conditions at receptor R7.

[3] Regulation 7(2) of the Noise Regulations specifies that a noise emission is taken to significantly contribute to a level if it exceeds a value which is 5 dB below the assigned level at the point of reception.

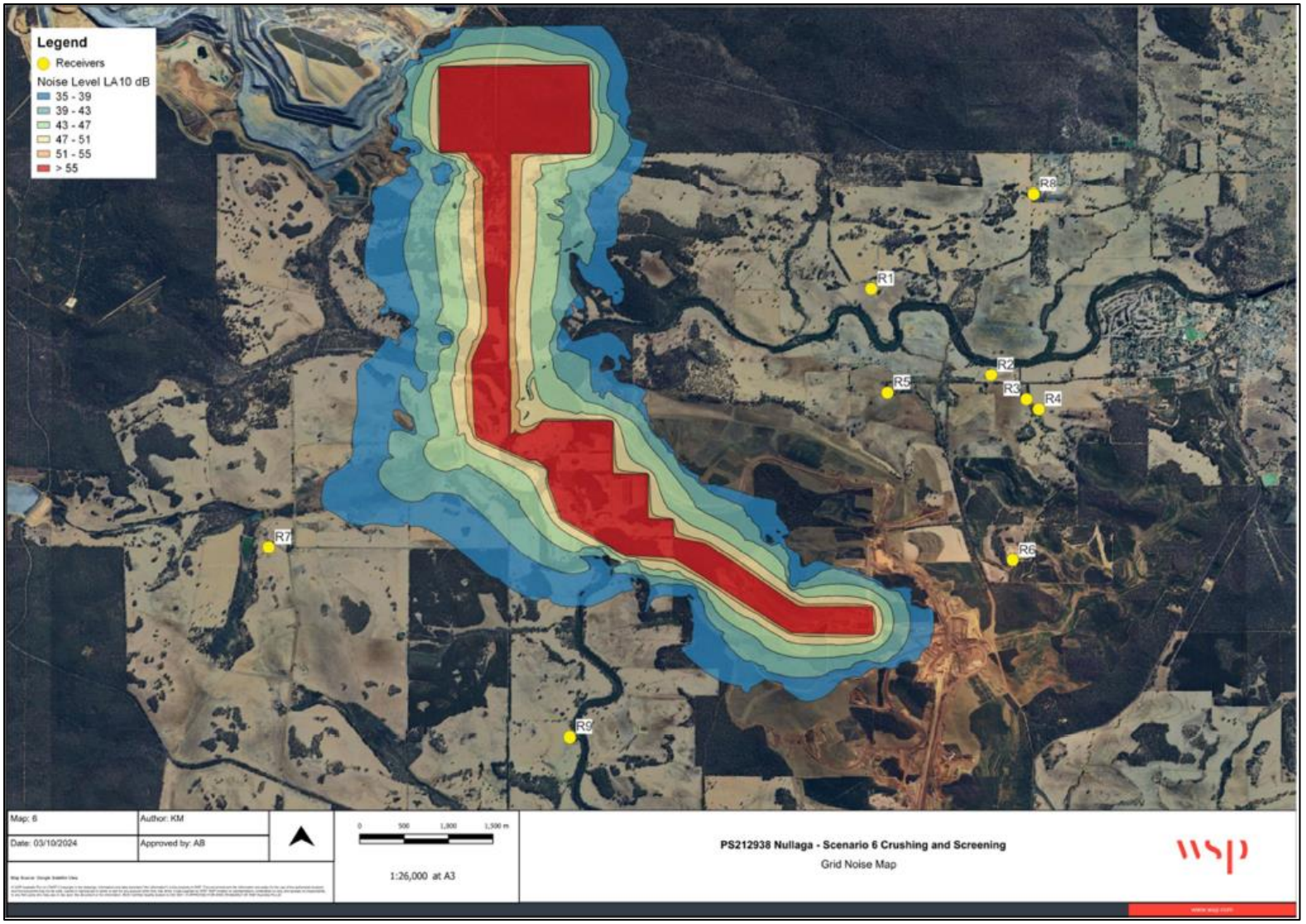

Figure 9: Noise modelling for crushing and screening plants (Sourced from South32 2024b)

While the sensitive human receptors surrounding the premises would also receive noise emissions from wider construction activities for the Nullaga Mine Expansion Project, assigned levels do not apply to these construction activities as they are exempt under Regulation 13. It is likely that noise emission sources received at the nearby receptors will not be limited to the operation of the crushing and screening plants, but the wider construction activities at the premises. The applicant intends to manage noise emissions from the various construction activities through the CNMP.

While the department has reviewed and commented on the CNMP, it was determined that the approval of the CNMP under regulation 13(3) of the Noise Regulations (for the purposes of out of hours construction activities) is better undertaken by the CEO of the Shire of Boddington. The department considers the Shire of Boddington to have a better understanding of the local siting and is better placed to manage potential noise issues that may arise. Further, the department does not support general approval for all out of hour construction activities encompassing the entire construction program. Approval for each out of hours construction activity event should be carefully planned/scheduled, justified (i.e., rationale for the construction needing to be undertaken during out of hours), and managed on a case-by-case basis (in accordance with the approved CNMP).

In considering the predicted noise levels, frequency and duration of the proposed crushing and screening activities, Delegated Officer has determined the consequence of this risk event as **moderate**. Further, in considering the predicted noise levels and the proposed noise mitigation measures, the Delegated Officer has determined the likelihood of this risk event to be **possible**. The resultant risk rating for this risk event is **moderate risk**. It should be noted that the sound power level for the crushing and screening equipment may be underestimated in the noise model, and the department has taken this uncertainty into consideration in determining the risk rating.

Consistent with the measures proposed in the CNMP, the Delegated Officer has conditioned the following requirements in works approval W6887/2024/1:

- Ensuring that the mobile crushing and screening plants installed at the premises have sound power levels that reflect those utilised in the noise model; and
- Use of non-tonal reversing alarms for mobile vehicles and machinery.

While the CNMP proposed a number of verification noise monitoring programs, including for confirming the sound power level of impact and vibratory sheet piling rig, noise received at receptor R7 during sheet piling activities, as well as in response to noise complaints, no verification noise monitoring was proposed for the operation of the crushing and screening plants.

As predicted noise levels indicate a likelihood of the relevant assigned levels being exceeded in some scenarios, the department has included conditions 11 to 14 to require the applicant to investigate the nature and extent of noise emissions during the normal operation of the crushing and screening plants, specifically in relation to night-time operations. Similar to the other verification noise monitoring programs detailed in the CNMP, the department considers receptor R7 to be the sensitive noise receiver most likely to be impacted.

If the required noise monitoring identifies that the relevant assigned noise levels are not being met, condition 14 requires the applicant to prepare and implement a plan to ensure compliance with the relevant assigned levels can be demonstrated. In accordance with the CNMP, this may include a number of proposed measures, including the use of alternative siting, constructing noise attenuation bunds, etc.

4. Consultation

Table 6 provides a summary of the consultation undertaken by the department.

Table 6: Consultation

Consultation method	Comments received	Department response
Local Government Authority (Shire of Boddington) advised of proposal on 29 February 2024.	The Shire of Boddington's response was received on 2 April 2024 and is presented below: 1. Concerns on the impacts to native vegetation and matters of national environmental significance (Black Cockatoos (Forest Red-tailed, Carnaby's and Baudin's), Woylie, Chuditch, Red-tailed Phascogale, Western Ringtail Possum, Quokka and Numbat). 2. Concerns with potential noise impacts and the lack of noise management and monitoring associated with it. 3. Concerns with potential dust impacts and the lack on monitoring associated with it. 4. Concerns on the impacts to local tourism and heritage trail sites.	The departments responses to the Shire's comments are presented below: 1. The department notes that the clearing of native vegetation has been assessed by the EPA under Part IV of the EP Act and will be regulated under a ministerial statement. The clearing of native vegetation is not assessed under this works approval. 2. Noise emissions have been assessed in section 3 of the decision report. 3. Dust emissions have been assessed in section 3 of the decision report. 4. The department notes that impact to local tourism is outside the scope of this assessment.
The Department of Biodiversity Conservation and Attractions (DBCA) on 29 February 2024.	DBCA's response was received on 4 April 2024 and is presented below: DBCA notes that the proposed activities are to be located on cleared farmland, and the capacity for the department to assess the application and apply appropriate regulatory measures under Party V of the EP Act. DBCA has no comments on the application.	Acknowledged.
The South West Aboriginal Land & Sea Council advised of proposed on 29 February 2024 and Gnaala Karla Booja Aboriginal Corporation (GKB AC) advised of proposal on 29 February 2024.	The South West Aboriginal Land & Sea Council forwarded the invitation to comment to the Gnaala Karla Booja Aboriginal Corporation (GKB AC) and their (GKB AC) response was received on 25 March 2024, stating that the GKB AC had decided not to comment on the application at that time.	Acknowledged.

Consultation method	Comments received	Department response
Application advertised on the department's website on 29 February 2024 for a period of 21 days.	A total of 36 submission were received on during the public comment period. Refer to Appendix 2.	The department has considered the comments received during the public comment period as part of this risk assessment. Responses to comments are presented in Appendix 2.
Applicant was provided with draft documents on 19 December 2024.	The applicant's response on the draft documents was received by the department on 8 January 2025. Refer to Appendix 1.	Refer to Appendix 1.

5. Conclusion

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

References

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2. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
3. Department of Water (DoW) 2013, Water quality protection note 68: Mechanical equipment wash down.
4. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
5. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
6. DWER 2021, *Draft Guideline: Assessment of environmental noise emissions*, Perth, Western Australia.
7. Environmental Protection Authority (EPA), *Environmental Protection (Noise) Regulations 1997*.
8. EPA 2005, Guidance of the Assessment of Environmental Factors (in accordance with the Environmental Protection Act 1986) Separation Distances between Industrial and Sensitive Land Uses, No.3.
9. EPA 2004, *Environmental Protection (Unauthorised Discharges) Regulations 2004*.
10. EPA 2018, Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual, Environmental Protection Authority, Perth, WA.
11. EPA 2024a, Recommended Environmental Condition, Worsley Mine Expansion – Revised Proposal.
12. EPA 2024b, Worsley Mine Expansion – Revised Proposal, South32 Worsley Alumina Pty Ltd, Report 1768, July 2024.
13. Newmont Boddington Gold Pty Ltd 2024, Annual Environmental Report January to December 2023, Report Number CR36678.

14. Ramsar 2024, The List of Wetlands of International Importance, Published on 22 March 2024, available at https://www.ramsar.org/document/list-wetlands-international-importance-ramsar-list sourced on 11 April 2024.
15. South32 2023, Worsley Alumina: Works Approval Application – Nullaga Project.
16. South32 2024a, Worsley Alumina: Works Approval Application – Request for further information response. Dated 31 May 2024.
17. South32 2024b, Nullaga Construction Noise Management Plan, Document Number: WOR-71183-FS-ENV-PLN-0004.

Appendix 1: Summary of applicant's comments on risk assessment and draft conditions

Condition	Summary of applicant's comment	Department's response
Condition 1 (Item 1)	The applicant has proposed a change of condition wording from: "Sound power level of the Mobile Crushing and Screening Plant 1 must not exceed 108dB(A)." to: "Sound power level of the Mobile crusher and Mobile screen must not exceed 108 dB(A) and 107 dB(A), respectively, when operated independently."	The proposed changes are in line with the applicant's CNMP and therefore does not change the potential risk to identified receptors as presented in section 3.2 of this decision report. The department has granted the proposed changes and has updated the conditions in the works approval.
Condition 1 (Item 2)	Proposed change for condition wording from: "Sound power level of the Mobile Crushing and Screening Plant 2 must not exceed 108dB(A)." to: "Sound power level of the Mobile crusher and Mobile screen must not exceed 108 dB(A) and 107 dB(A), respectively, when operated independently."	
Condition 1 (Item 3)	Proposed change from: a) 1x concrete hardstand suitably sized to accommodate a road tanker; b) 1x concrete hardstand suitably sized to accommodate a heavy vehicle; to instead require the construction of Concrete hardstand or compacted, lined earthen pad to be installed under hydrocarbon storage and refuelling facilities where there is potential for hydrocarbon spills.	The department has reviewed the proposed change and has granted the request to allow either a concrete hardstand or a compacted lined earth pad to be installed under hydrocarbon storage and refuelling facilities. To ensure that risk to receptors from hydrocarbon spills or leaks remains at an appropriate level the department has included an additional requirement for the compacted lined earth pad to achieve a minimum permeability of 1×10^{-9} m/s. The works approval and decision report has been amended to reflect these changes.
Condition 1 (Item 3g)	Proposed change from the OWS to now consist of a full retention separator instead of a bunded triple interceptor arrangement.	It is understood that full retention separators are designed to treat a higher flow than triple interceptor arrangements which will in turn reduce the likelihood of contaminants impacting potential receptors.

Condition	Summary of applicant's comment	Department's response
		There is no change to the risk assessment presented in section 3.2. The works approval and decision report has been amended to accept these changes.
Condition 1 (Item 3h)	Proposed change to remove the requirement for the OWS to have a minimum total capacity of 50 kL and instead require the OWS the have a minimum treatable flowrate of 5 L/s.	The department has granted this condition change requiring the OWS to have a minimum capacity of 50 kL to require the OWS to have a minimum treatable flowrate of 5 L/s. Due to the proposed change in OWS units and operation methodologies a requirement for a minimum total capacity for a full retention separator is not required. There is no change to the risk assessment presented in section 3.2. The works approval and decision report has been amended to reflect these changes.

Appendix 2: Summary of comments submitted during public comment period

Item	Concern	Number of submissions	Description of concern	Department's response
1	Transparency and lack of engagement	28	Applicant's lack of transparency and/or lack of community and stakeholder engagement/consultation.	Applicants are encouraged to engage with the community regarding new and planned proposals. It is, however, not a legal requirement for the applicant when applying for an approval under Part V Division 3 of the EP Act. Under section 54(2)(b) and section 57(2) of the EP Act, the department may seek comment from any public authority or person who (in the opinion of the CEO and/or their Delegated Officers) has a direct interest in the subject matter of the application. In addition, section 54(2a) and section 57(2a) of the EP Act also requires the application for a new works approval or licence to be advertised on the department's website, where any person who wishes to comment on it may do so within the period specified in the advertisement. Submissions received by the department during the public consultation stage are considered in the risk assessment process.
2	Dust and noise emissions	28	Respondents indicated that they are currently experiencing or have concerns over the proposed infrastructure potentially emitting additional dust and its potential impacts on the community, including public health and amenity.	The assessment of this works approval is limited to the construction and time limited operation of two mobile crushing screening plants, as well as the oily water separator and associate infrastructure at the non-process infrastructure (NPI) facility. The emissions and discharges associated with these activities, as well as the potential risk of impact to surrounding human and environmental receptors have been assessed in section 3. In determining the risk associated with each risk event, the department has also considered relevant controls proposed by the applicant (listed in Table 1).

Item	Concern	Number of submissions	Description of concern	Department's response
				Based on the risk rating for each risk event, the department has included conditions in works approval W6887/2024/1 to manage the potential risk of impacts associated with emissions and discharges from the proposed activities, in accordance with the accordance with the department's *Guideline: Risk Assessment* (2020b). Reports on environmental incidents, including excessive emissions of dust and noise can be reported to the department through Environment Watch.
3	Risk assessment	26	Respondents do not agree with the risk assessment that the applicant has provided for the works approval application and feel like that are misleading or not correct.	The department has completed its own risk assessment (refer to section 3), in accordance with the department's *Guideline: Risk Assessment* (2020b). The risk assessment was informed by the information provided by the applicant, technical expert knowledge base within the department, as well as comments received by direct interest stakeholders and general public during the public advertising period.
4	Noise emissions	26	Respondents have raised concerns of additional noise emitted from the premises affecting nearby residences.	The department has completed a detailed risk assessment on the potential noise impacts associated with crushing and screening activities at the premises (refer to section 3.3). Noise emissions from the wider Nullaga Mine Expansion Project have not been assessed under this works approval. Nevertheless, the applicant must adhere to the requirements of the *Environmental Protection (Noise) Regulations 1997.*
5	Crushing and screening plant siting locations and potential impacts to Hotham River	26	Respondents are concerned with the proposed location of the crushing and screening plants and its proximity to the Hotham River and/or the potential emissions or discharges from entering Hotham River.	The department has considered these risk events in its risk assessment (refer to section 3), in accordance with the department's *Guideline: Risk Assessment* (2020b). Potential impacts to the Hotham River have been considered as a result of dust deposition as well as sediment laden stormwater from the crushing and screening operational areas. Specifically, the department has required additional regulatory controls be implemented by the applicant to manage sediment laden stormwater as the applicant had not proposed any controls to manage this emission.

Item	Concern	Number of submissions	Description of concern	Department's response
6	Applicant's operating history	24	Respondents have concerns regarding the applicants history of fines, financial penalties and other Premises operations.	The department has considered the history of non-compliances, fines, fees and complaints against the applicant. The compliance and operational history of the applicant is taken into consideration during the risk assessment , (refer to section 3) when determining the likelihood rating for risk events, in accordance with the department's *Guideline: Risk Assessment* (2020b). Where the resultant risk rating is medium or high, the department may apply regulatory controls. Where the resultant risk rating is extreme, the application may be refused.
7	Noise and dust modelling	24	Respondents are concerned on why noise and dust modelling were not done for the application and are concerned why dust emissions is listed as "unknown" within the works approval application.	During the assessment of the works approval, the department requested the applicant provide a noise model as well as relevant noise management plans to support the assessment of the crushing and screening operations. These were considered in the detailed risk assessment for noise emissions, as detailed in section 3.3 of the decision report. The request was made after the public advertisement of the application. As such, these documents were not advertised on the department's website. The department has determined that the modelling for dust emissions is not required. The rationale for this is included in section 3.2 of the decision report.
8	Environmentally sensitive areas	22	Respondents are unsure why the Hotham River is not listed as an environmentally sensitive area use and have concerns with potential emissions and discharges associated with the proposed activities could have an impact on the river and the RAMSAR listed downstream Peel-Harvey Estuary.	The current list of Environmentally Sensitive Areas is listed within the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*. The Hotham River does not qualify for any items listed under Environmentally Sensitive Areas. It is also noted that the Hotham River is not listed as a RAMSAR wetland. Nevertheless, the department has recognised the Hotham River as an environmental and cultural receptor (as detailed in section 3.1.2 of the decision report) and has assessed the potential impacts to the Hotham River in the risk assessment (as detailed in section 3.2 of the decision report).

Item	Concern	Number of submissions	Description of concern	Department's response
9	Monitoring of the treated wastewater and waste oil	21	Respondents have concerns with the proposed frequency monitoring of the treated wastewater from the evaporation pond and the absence of any monitoring of the oil generated from the OWS.	The department has reviewed the proposed monitoring frequency and deemed it to be adequate. Section 3.2 presents the risk assessment of the operation of the OWS and requirements conditioned in works approval W6887/2024/1 to manage the relevant risk events. The department has determined that the monitoring of waste oil from the OWS is not required and has not been conditioned in the works approval. Monitoring of the waste oil has minimal value in assessing and managing potential impacts to sensitive receptors, noting that the waste oil will be kept at the premises and periodically sent offsite for disposal at an appropriately licensed waste facility. Nevertheless, a condition has been added to the works approval to routinely inspect the OWS in order to detect any incidental spills or leaks.
10	Waste oil and licenced waste facility	21	Respondents mentioned that the licenced waste facility that will accept the waste oil was not listed in the works approval application.	A specific licensed waste facility is not required to be listed within the application. It is the applicant's responsibility to ensure that an appropriate licensed waste carrier is used to collect and transport the waste from the premises. It is also the licensed carrier's responsibility to ensure that the waste is transported appropriately and in accordance with the *Environmental Protection (Controlled Waste) Regulations 2004*.
11	Distance to receptors measurement point	20	Respondents were concerned that the distance to receptors was taken from the mid-point between the two mobile crushing and screening plants.	To inform the department's risk assessment, measurements were taken from the proposed prescribed premises boundary to each receptor presented in Figure 6. The approximate measured distances from the premises boundary to the receptors are listed in Table 2. The distances meet the recommended distances for these types of operations as listed in the EPA's *Guidance for the Assessment of Environmental Factors: Separation Distances between Industrial and Sensitive Land Uses (2005)*
12	Prevailing wind direction	20	Respondents indicated that the dominant wind direction in the area is a westerly towards the Boddington township.	Section 3.1.3 of the decision report provides historical meteorology data, sourced from the Bureau of Meteorology's Wandering Weather Station (ID 010917). The meteorological data was assessed to inform in risk assessment presented in section 3.2 of the decision report.

Item	Concern	Number of submissions	Description of concern	Department's response
13	Current assessment under EPA	20	Respondents are concerned that the works approval assessment is occurring prior to the decision made by the Minister for Environment regarding an amended Ministerial Statement for the wider project.	Amendments to the *Environmental Protection Act 1986*, through the proclamation of the *Environmental Protection Amendment Act 2024* on 28 November 2024, now enables other decision-making authorities to determine applications prior to the final decision of a Part IV outcome being made. Where a works approval is granted prior to a determination made under Part IV of the EP Act, an amendment may need to be undertaken to ensure conditions of the works approval are consistent with the Part IV approval. Note that the granting of a works approval does not allow the proponent to legally implement a proposal while a decision has not yet been made under Part IV of the EP Act. In this circumstance, a ministerial statement (MS1237) was granted on 20 December 2024 allowing the department to ensure that there are no contradictions between the granted ministerial statement and the works approval conditions.
14	OWS siting location	6	Respondents are concerned that the OWS is within a catchment and/or is in close proximity to the Hotham River.	The department has considered this risk event in its risk assessment (refer to section 3.2), in accordance with the department's *Guideline: Risk Assessment* (2020b). The risk assessment has considered catchment areas, proximity to the Hotham Rover and the proposed management controls. Potential impacts to the Hotham River, and associated tributaries have been considered as a result of spills and leaks from the OWS and associated infrastructure at the NPI facility. A condition has been added to the works approval to routinely inspect the OWS in order to detect any incidental spills or leaks.
15	Impacts to flora	6	Respondents are concerned about the potential impacts to native, threatened and priority flora. a. Two respondents were concerned about the impacts to carnivorous plants; and b. One respondent addressed concerns that listed flora in the region are not fully assessed.	The department has considered the potential impacts to native and priority flora, as well as priority ecological communities, in its risk assessment (refer to section 3.2), in accordance with the department's *Guideline: Risk Assessment* (2020b). The department is only able to assess known flora within the region. Table 2 lists known threatened and priority flora as a potential receptor within and around the premises.

Item	Concern	Number of submissions	Description of concern	Department's response
16	Acid sulfate soils, groundwater usage and greenhouse gases	5	Respondents are concerned with the acid sulfate soils risks, groundwater usage and greenhouse gases associated with the proposed operation.	Acid sulphate soils and greenhouse gas emissions are not considered a relevant emission associated with the construction and operation of the crushing and screening plants and OWS. The department notes that greenhouse gas emissions expected to be emitted from the operations of crushing and screening plants is relatively minor compared to the broader scope of the Nullaga Mine Expansion Project. Groundwater usage is not regulated under Part V Division 3 of the EP Act. Approval to abstract water from Proclaimed Surface Water and Groundwater Area is regulated under the *Rights in Water and Irrigation Act 1914,* which is a separate approval process. The applicant has confirmed that the following approvals have been applied for: • a permit to interfere with the bed and banks of a water course (Thirty-four Mile Brook and Wattle Hollow Brook) – submitted February 2024 (reference 062184); • a permit to interfere with the bed and banks of a water course (Dilyan's Crossing) – submitted June 2024 (reference 064675); and • a licence to take surface water – submitted November 2024 (reference 068248).
17	Impacts to fauna	4	Respondents are concerned about impacts to native, threatened and priority fauna.	The department has considered the potential impacts to native, threatened, and priority fauna in its risk assessment (refer to section 3.2), in accordance with the department's *Guideline: Risk Assessment* (2020b).
18	Aboriginal and/or heritage sites	4	Respondents are concerned about potential impacts to nearby Aboriginal and/or heritage sites.	While the department does not have a direct role in assessing aboriginal heritage culture or native title matters, the department has considered the potential impacts to Aboriginal heritage sites in its risk assessment (refer to section 3.2), in accordance with the department's *Guideline: Risk Assessment* (2020b). Aboriginal culture and heritage are predominantly regulated by the Department of Planning, Lands and Heritage under the *Aboriginal Heritage Act 1972.*

Item	Concern	Number of submissions	Description of concern	Department's response
19	Treated wastewater as dust suppression	3	Respondents were concerned about the use of treated wastewater for dust suppression.	The department has considered this risk event in its risk assessment (refer to section 3.2), in accordance with the department's *Guideline: Risk Assessment* (2020b). Potential impacts to surrounding native vegetation and localised soils have been considered, as a result of the proposed use of treated wastewater for dust suppression. To manage potential impacts associated with this risk event, the department has conditioned the treated wastewater quality monitoring program proposed by the applicant. In addition, the target of 15 mg/L proposed by the applicant for hydrocarbons has been specified in the works approval as a limit. In addition, the department has also required benzene, toluene, ethylbenzene, and xylene be included in the wastewater quality monitoring program, and has specified a limit for these parameters, in accordance with the *Water quality protection 68: Mechanical equipment wash down* (DoW 2013).
20	Tourism, businesses and public enjoyment.	3	Respondents were concerned about impacts to tourism, businesses and the "Tullis Bridge" which is an area of public enjoyment.	Impacts to receptors likely to be impacted from emissions and discharges at the premises have been considered in this risk assessment. Where a receptor has a value of public enjoyment, the department will assess impacts to people using that area from a health and amenity perspective. For social surrounding matters such as tourism and impacts to businesses, these are factors considered through the EPA's assessment. EPA Report 1768 noted a mitigation measure proposed by the applicant for reducing direct and indirect impacts to social surroundings, which included the Tullis Bridge picnic area.