Decision Report

Application for Licence

Division 3, Part V *Environmental Protection Act 1986*

Licence Number	L9113/2018/1
Licence Holder	B. & J. Catalano Pty Ltd
ACN	008 961 975
File Number	DER2018/000081
Premises	Shenton Ridge Hard Rock Quarry Coalfields Road ROELANDS WA 6226 Part of Lot 501 on Plan 26892 As defined by the coordinates in Schedule 1 of the Licence.
Date of Report	21 August 2019
Status of Report	Final

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1. Definitions of terms and acronyms

In this Decision Report, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
AS/NZS 5667.1:1998	Australian Standard AS/NZS 5667.1:1998 *Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples*
AS/NZS 5667.4:1998	Australian Standard AS/NZS 5667.4 *Water Quality – Sampling – Guidance on sampling from lakes, natural and man-made*
AS/NZS 5667.6:1998	Australian Standard AS/NZS 5667.6 *Water Quality – Sampling – Guidance on sampling of rivers and streams*
ACN	Australian Company Number
ARI	Annual Recurrence Interval
ASC NEPM	*The National Environment Protection (Assessment of Site Contamination) Measure 1999*
Category/ Categories/ Cat.	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
dB	Decibels
dB(A)	A-weighted decibels
Decision Report	refers to this document
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the EP Act
DWER	Department of Water and Environmental Regulation
EIL	Extractive Industry Licence
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)

km	Kilometres
Licence Holder	B. & J. Catalano Pty Ltd
Licence	This Licence (L9113/2018/1)
mm/hr	Millimetres per hour
NTU	Nephelometric Turbidity Units
mbgl	Metres below ground level
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)
Occupier	has the same meaning given to that term under the EP Act
Prescribed Premises	has the same meaning given to that term under the EP Act
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report
Primary Activities	as defined in Schedule 2 of the Revised Licence
Risk Event	As described in *Guidance Statement: Risk Assessment*
SAT	State Administrative Tribunal
WMP	Water Management Plan (Landform Research, July 2017)

2. Purpose and scope of assessment

2.1 Background

B. & J. Catalano Pty Ltd (Catalano) is the owner of Lot 501 Coalfields Road (Shenton Ridge) located near Roelands, approximately 25 kilometres (km) east of Bunbury. Catalano has operated a gravel quarry in the northern part of Lot 501 for a number of years. The Shenton Ridge Gravel Quarry is subject of works approval W5709/2014/1 and licence L8877/2015/1. Catalano has re-opened a hard rock (granite) quarry in the southern part of Lot 501 Coalfields Road (Lot 501) and were granted Works Approval W5828/2015/1 on 6 February 2018. This Decision Report assesses the infrastructure constructed and the operational emissions and discharges risk upon public health and the receiving environment.

2.2 Application and scope of assessment

B. & J. Catalano Pty Ltd (Applicant) submitted an Application on 15 January 2018 for a licence under the *Environmental Protection Act 1986* (EP Act) for Category 12 screening of material operation on the southern part of Lot 501. The application is for crushing and screening of up to 100,000 tonnes of hard rock material per year. The lifetime of the operation is estimated to be 20 years.

Table 2 lists the prescribed premises categories that have been applied for.

Table 2: Prescribed Premises Categories

Classification of Premises	Short description	Production or design capacity	Premises production or design capacity or throughput[1]
Category 12	Screening etc. of material	50,000 tonnes or more per year	1,752,000 tonnes per year design capacity (based on throughput between 150 - 400 tonnes per hour).

Note 1: The design capacity is currently limited by the hours of operation conditioned in State Administrative Tribunal (SAT) decision DR 17/2016.

The Shenton Ridge Hard Rock Quarry consists of a quarry pit and a separate processing area.

Figure 1 depicts the location of the quarry pit and separate processing area in relation to the gravel operation (authorised through licence L8877/2015/1) and the surrounding land.

Category 12 screening etc. of material is listed in Schedule 1 to the *Environmental Protection Regulations 1987* (EP Regulations). The prescribed threshold for Category 12 is 50 000 tonnes per year. Catalano has applied to process up to 100,000 tonnes of material per year, therefore the property is a prescribed premises for the purposes of Part V of the *Environmental Protection Act 1986*.

Category 12 prescribed activities (as defined in the EP Regulations) relates to processing of material extracted from the ground such as screening, washing, crushing, grinding, milling, mechanical sizing or separation.

Mining, free digging, excavating, quarrying and blasting do not constitute screening etc. of material and therefore do not fall within the scope of Category 12. The processing area will contain the crushing and screening plant and therefore will form the Category 12 prescribed premises, with the extraction area (quarry pit) falling outside the premises boundary.

This Decision Report assesses emissions and discharges associated with the operation of infrastructure relating to the processing area only:

- Mobile primary, secondary and tertiary crushers with related screens and conveyors;
- Material stockpiles and contaminated storm water infrastructure.

This assessment has resulted in the Department of Water and Environmental Regulation (DWER) issuing Licence L9113/2018/1 (Issued Licence) in Attachment 1.

3. Overview of Premises

3.1 Infrastructure

The processing and associated infrastructure, as it relates to the Category 12 activities, is detailed in Table 3 and with reference to the plans in Works Approval (W5828/2015/1) and subsequent compliance report confirming what infrastructure was constructed.

Table 3 lists infrastructure associated with Category 12 prescribed premises activities.

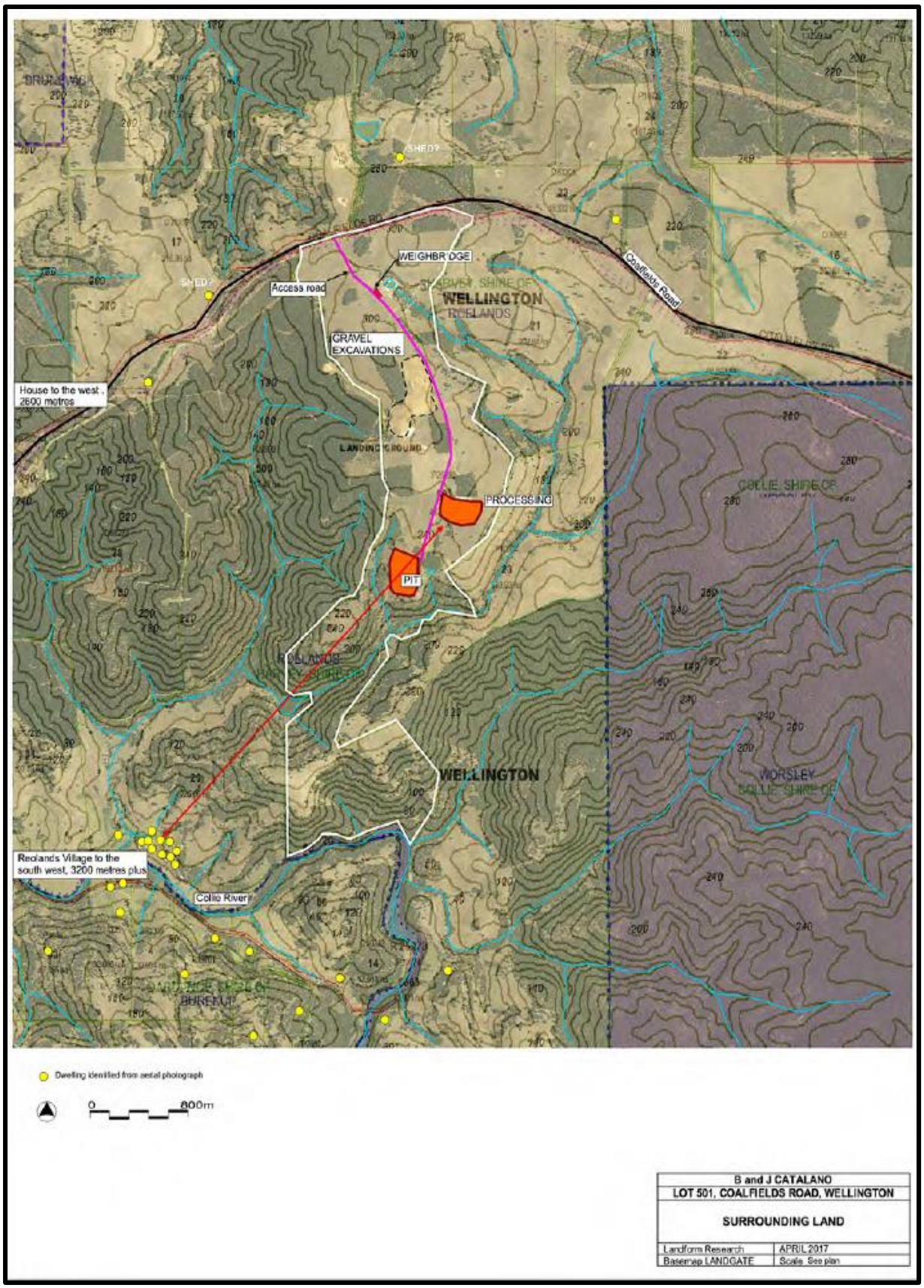


Figure 1. Location of Shenton Ridge Hard Rock Quarry processing area and surrounding land

Table 3: Category 12 processing infrastructure

	Category 12 Infrastructure[1]	W5828/2015/1 'approved infrastructure'	W5828/2015/1 'as constructed' infrastructure
The processing operation is to consist of a primary mobile crusher, together with secondary and tertiary crushers, followed by sizing screens and product washing facilities. Stormwater management infrastructure consists of a series of detention basins and infiltration areas to allow for the settlement of solids. Noise monitoring is proposed to assessment the need for screening barrier on the east side of the processing area to ensure compliance with the 60 dB(A) at the boundary of the rural lot to the east (Lot 23). A noise screening barrier to the west is proposed in the event that a residence is built on Lot 500 Coalfields Road.			
1	Primary crusher	Located in the 5.1 Ha processing area, with floor level at RL 241 to 240 m that sloping towards the north. Spray bars, conveyor dust covers and dust aprons covering transfer points.	Located in the 2.14 Ha processing area, with floor level at RL 241 to 236 m that slopes south as depicted in Figure 3. Increased setback from eastern neighbour boundary from 50 m to 220 m as depicted in Figure 3. Maintain the 7 to 10 m natural ridge on east and northern side of processing area as a natural noise screening barrier. Plant controls including dust covers, spray bars and dust aprons have been installed.
2	Secondary crusher		
3	Tertiary crusher		
4	Screening plants		
5	Generators		
6	Front end loader		
7	Perimeter bunds/batter slopes (safety bunds) -	Located near and within the processing area and depicted in Works Approval Schedule 1 plans. New reduced processing area shown in Figure 2 of this Report.	Figure 3, observed and photographed.
8	Cut-off drains		Diverting uncontaminated stormwater away from processing area
9	Processing area main detention basin		Replaced by North West and Southern basins with surveyed capacity of 2,512 m^3.
10	Processing area contingency detention basin		Replaced by North West and Southern basins (2,512 m^3)
11	Upslope cut-off drain		Diverts uncontaminated stormwater away from processing area.
12	Western batter slope beside central haul road.		Engineering advice provided on the stability of Western batter beside the central haul road.
13	Western batter slope infiltration area contingency detention basin		South West basin current plant water supply with surveyed capacity of 1,266 m^3
14	Eastern batter slope infiltration area		Ridge remains so infiltration area not required.
15	Eastern batter slope contingency detention basin		South East basin gathers roads and cut-off drain runoff (1,524 m^3)
16	Gutters/outlets installed at release points on all detention basins		Observed and photographed all rock pitched protected spillways from detention basins.
17	Raw material and product stockpiles		Observed and photographed the location of aggregate material draining into the North West and Southern basins.
18	Western and Eastern noise bunds		Not constructed as domicile on Lot 500 is yet to be built / occupied and the eastern ridge has been retained.

Note 1: The western noise screening bund is to only be constructed in the event that a residence is built on Lot 500 Coalfields Road and therefore is not included in Table 3.

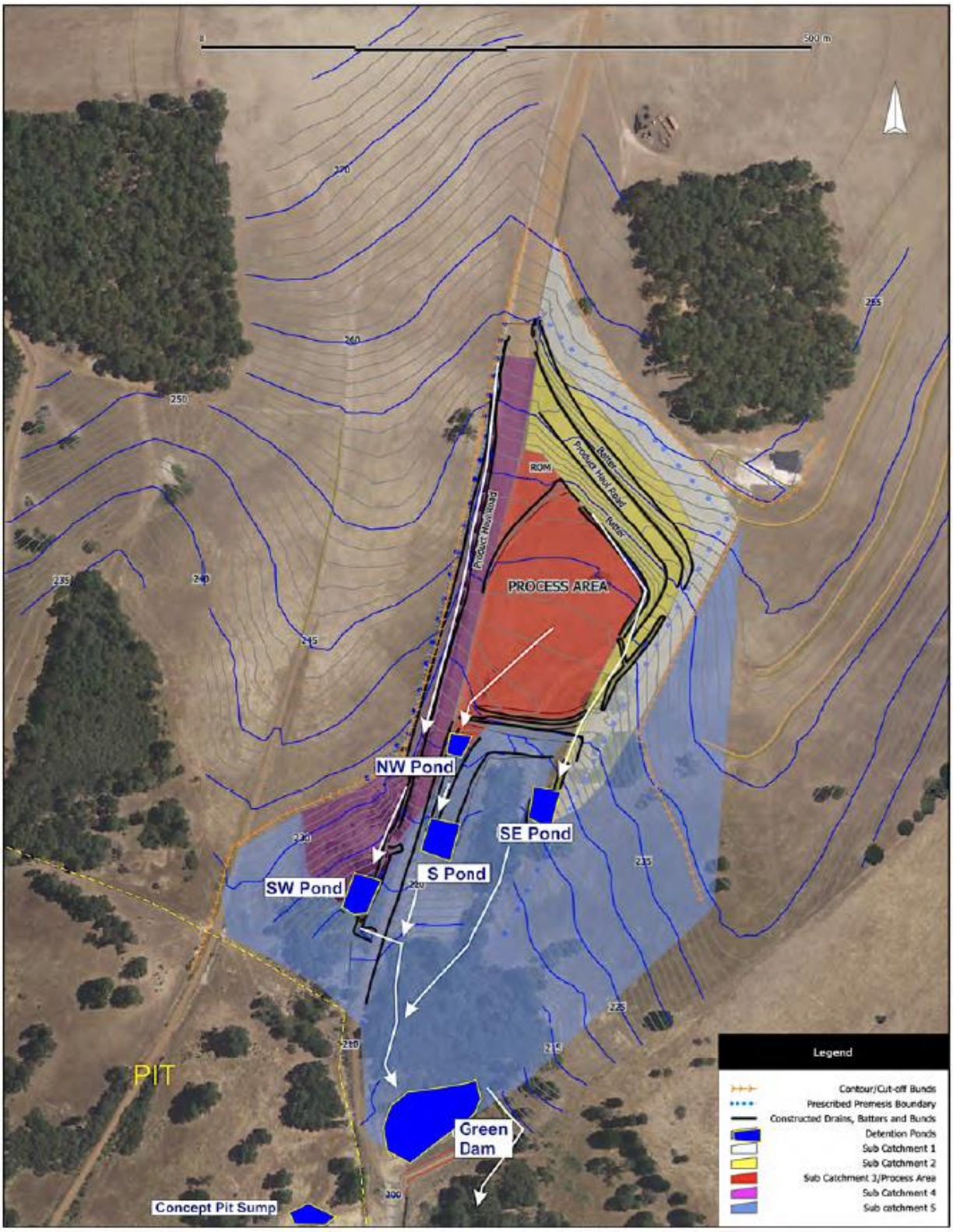


Figure 2: Plan of process area and storm water infrastructure as of 14 May 2019.

Following the Ministers determination of the appeal against works approval (W5828/2015/1) plus upon review of the Compliance Report submitted by the Applicant on 8 August 2018, it became apparent that the processing area had reduced size from 5 Ha to 2.14 Ha and the storm water infrastructure design had been significantly altered. These infrastructure alterations required reassessment to ensure emissions and discharges would not increase

and impact nearby receptors. Catalano initiated the infrastructure changes in line with Works Approval Condition 2 but required quantifying and reassessment by DWER. Following an inspection by DWER, it was determined further information and construction works were required to ensure the detention pond volumes adequately meet the initial standards assessed at works approval. A final Compliance Report was prepared and submitted on 14 May 2019, allowing the licence assessment to recommence and become decided.

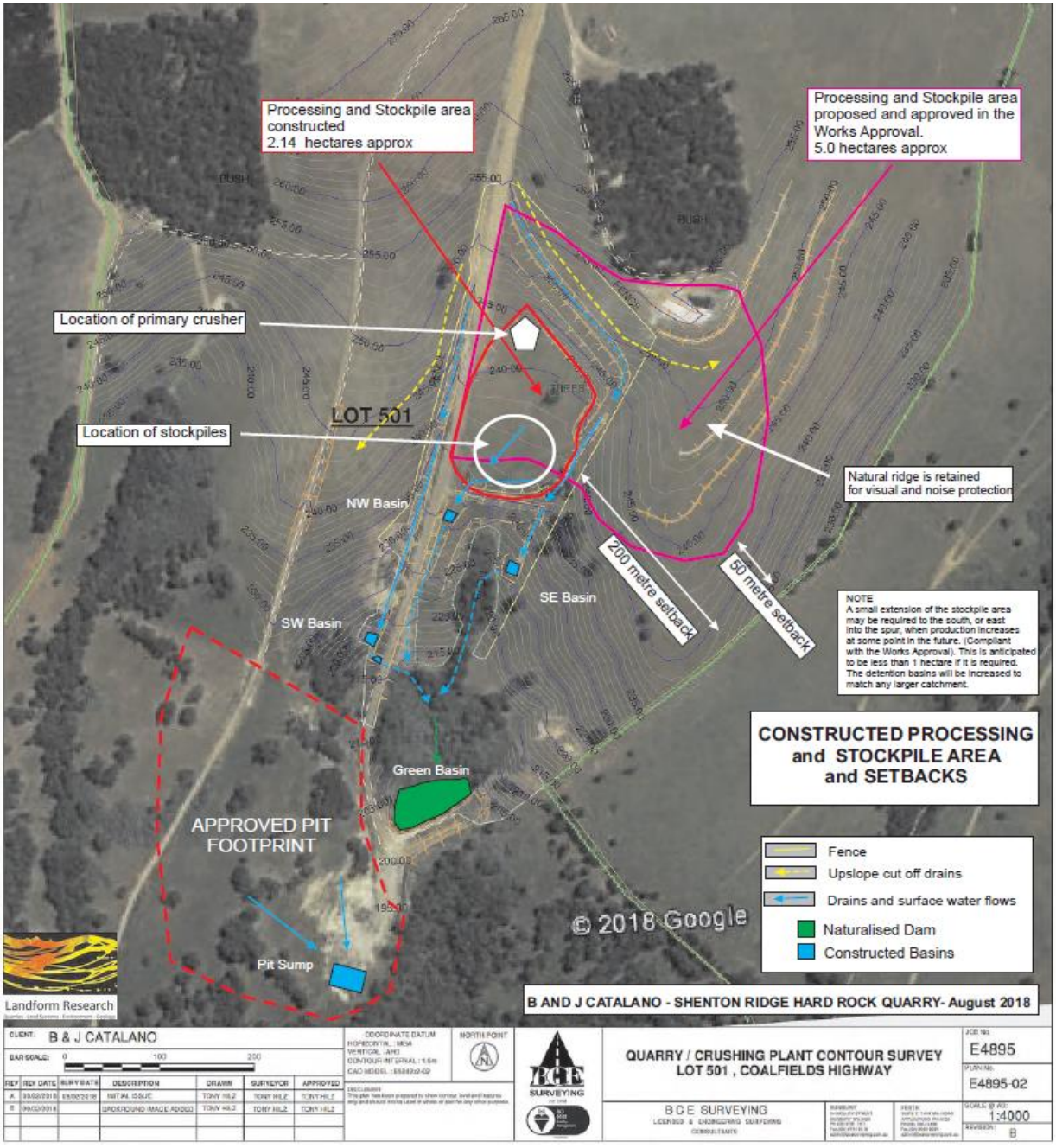


Figure 3: Processing area, storm water management infrastructure constructed as of 4 August 2018

3.2 Other ancillary infrastructure

The Applicant will also be installing a portable system for ablutions. All waste will be pumped out by a licensed contractor and disposed off-site. General waste will be removed off-site to an approved landfill facility (Landform July 2017).

A 20,000 litre double-skinned mobile, skid mounted diesel fuel tank will be located within a bunded and lined enclosure within the process area footprint (Landform July 2017).

There is to be no major mechanical servicing undertaken on-site nor vehicle wash-down facilities proposed (Landform, July 2017).

3.3 Description of processing activities

The processing of granite hard rock to produce various grades of product will utilise a mobile primary, secondary and tertiary crusher, followed by sizing screens and the potential for product washing facilities. The blending of material to order will also be undertaken within the processing area (Landform August 2018).

The processing plant is to be located to the north-west of the processing area as depicted in Figure 3.

The processing plant and stockpiles will be sprayed with water or enclosed, if possible, to reduce the emission of dust during processing. Water used for dust suppression and process plant dust suppression (spray bars) will be sourced from the south west, south or green basins and/or recycled through the processing and stockpile area detention basins (Landform August 2018).

The processing of excavated material is to be undertaken in short campaigns throughout the year, generally consisting of a few weeks at a time. Material will be stockpiled, loaded and removed from the property as required by the local market demands (Landform July 2017).

3.4 Stormwater management

In accordance with Condition 4 of the development approval granted by SAT, a revised Water Management Plan (WMP) has been developed for the Premises (Landform, July 2017). The WMP proposes the construction of storm water infrastructure including diversion bunds, cut-off drains, detention basins etc, and surface water monitoring.

Figure 2 depicts the surface water sub catchments within the Premises. The sub catchments are:

- Processing and stockpile catchment (2.14 ha) depicted by red area that drains to NW and S basins.
- Western batter slope catchment (1.9 ha) depicted by purple area that drains to SW basin.
- Eastern batter slope catchment (3.1 ha) depicted by the white and yellow area that drains to the SE basin.

As required during the assessment of the licence application, a licenced surveyor was engaged by the Applicant to complete volumetric surveys of each detention basin and the results are provided in Figure 4 below.

Processing and stockpile catchment

Any excess water from the processing area catchment will be directed south into the NW basin initially and then overflow into the S basin to allow for the settlement of solids. The NW and S basins are sized to contain a minimum of 2 hours' run-off resulting from a 10 year Average Recurrence Interval (ARI) rainfall event. This equates to 40 mm of rainfall. The capacity of the detention basins has been surveyed with a combined capacity of 2,512 m^3.

Overflow from the detention basins is to be directed into the watercourse, on the eastern side of S basin that drains through vegetation toward the Green basin as a final water treatment prior to discharge. The red arrows in Figure 4 depict the process and stockpile catchment water flow direction. All detention basins have protected outlets to minimise erosion and aid in

reducing the water energy and dropping out suspended solids.

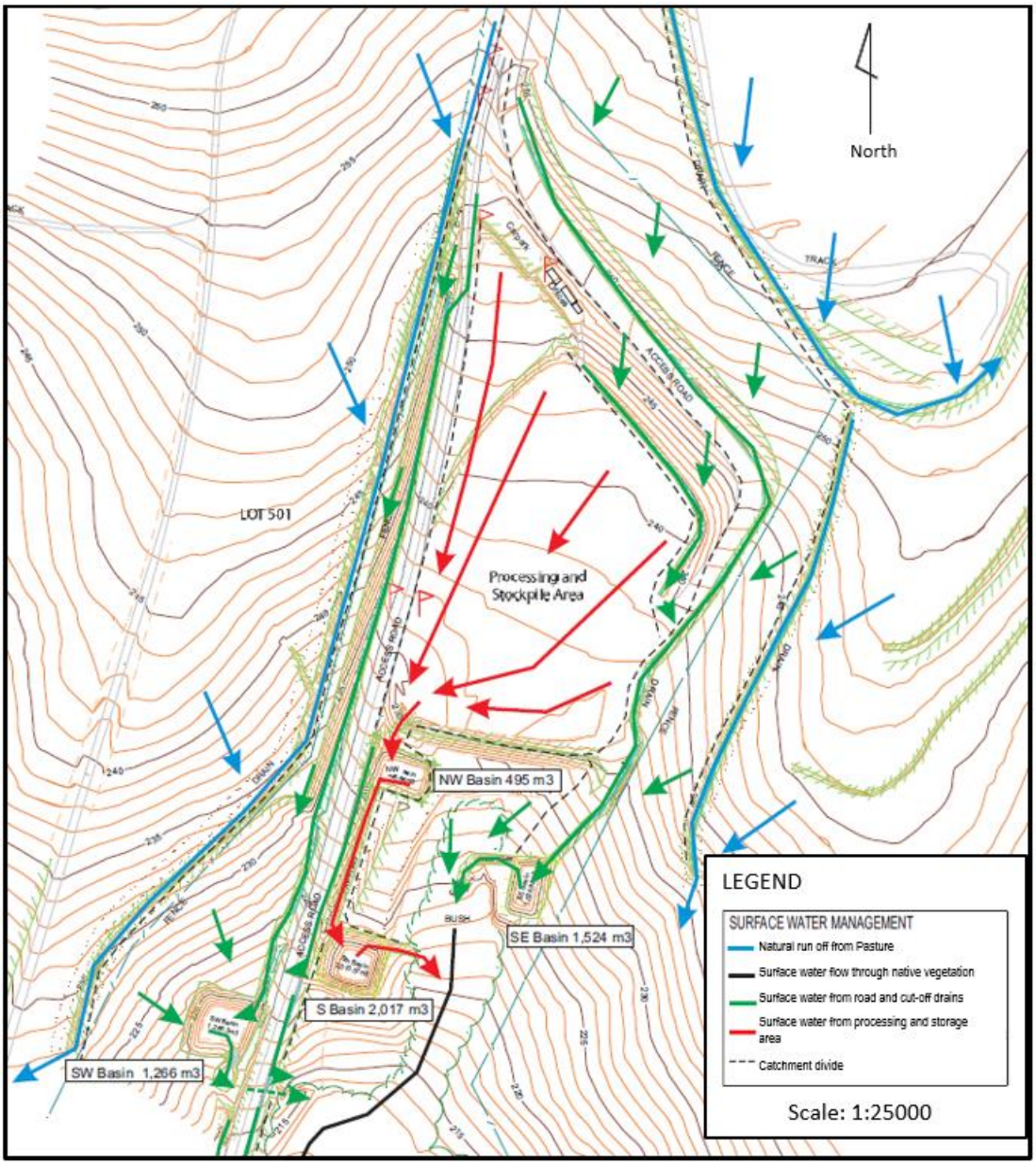


Figure 4: Surface water flows, catchments and basin capacities – 14 May 2019

Western batter slope catchment

This catchment has an area of 19,000 m^2 and consists of the product haul road located west of the process area and the haul road drains leading back towards the hard rock quarry. The catchment include the western haul road drainage including haul road run-off. The western batter slope catchment drains to SW basin and is sized to contain a minimum of 2 hours' run-off resulting from a 10 year ARI rainfall event. This equates to 40 mm of rainfall. The surveyed capacity of the SW basin is 1,266 m^3.

All overflow from the SW basin is directed under the haul road and released into the water course towards the Green basin as a final water treatment prior to discharge. The green arrows on the western side of the haul road in Figure 4 depict the western batter water flow direction.

The SW basin was deepened and its capacity expanded in March 2019. The construction

included the rock pitching and concrete reinforcement of the inlet and outlet to minimize erosion and aid in reducing water energy and dropping out sediments.

The haul road drainage down gradient from the SW basin reports directly to the hard rock quarry pit where it is captured and retained within the pit. The down gradient eastern side haul road drains are directed into the Green basin to drop out sediments prior to discharge.

On 25 March 2019, the western batter slope was assessed for its stability and slope suitability by consultant engineers GHD. Based upon the information provided plus an onsite visual assessment, GHD determined there was minimal risk of sediment being discharged outside the toe drain and the SW Basin plus the batter slope was considered suitably designed for local weather conditions.

A noise bund of 6 m high by 40 m in length was proposed to be constructed on the western edge of this catchment adjacent to the processing area should a residence be built on Lot 500 in the proposed location assessed at works approval. Noise monitoring and acoustics assessment will assess the requirement for the western noise bund should the building of the Lot 500 residence commence.

Eastern batter slope catchment

The catchment has an area of 31,000 m^2 and consists of the northern and eastern catchment adjoining the process and stockpile area and includes a vehicle access into the process area, road drainage and cut-off slopes. The eastern batter slope catchment discharges to SE basin and has been sized to contain a minimum of 2 hours' run-off resulting from a 10 year ARI rainfall event. This equates to 40 mm of rainfall. The licensed surveyor has determined the volume of the SE basin as 1,524 m3.

Overflow from the SE detention basin is directed into the watercourse from the western side of basin which drains through the watercourse vegetation toward the Green basin as a final water treatment prior to discharge. The green arrows on the northern and eastern side of the process area in Figure 4 depict the eastern batter water flow direction.

The SE basin has protected inlets and outlets to minimize erosion and aid in reducing water energy and dripping out suspended solids.

A noise bund was proposed to be constructed 4 metres high by 150 metres in length but with the reduced process area and the natural ridge located east of the site remaining there is no need at this time for its construction. The applicant has committed to undertake noise monitoring to confirm sound power levels once the licence has been assessed.

Upslope cut-off drain

Cut-off drains on the upslope of the processing area will divert natural run-off from the upslope pasture and remnant forest. The cut-off drain will retain the run-off with excess diverted away from the process area. The blue arrows in Figure 4 indicate the upslope cut-off drainage design constructed at the Premises.

Surface water monitoring

The Water Management Plan proposes the monitoring of total suspended solids (TSS), total dissolved solids (TDS), Total Recoverable Hydrocarbons (TRH), Turbidity and pH from autumn to spring (minimum of 4 samples), when the processing area and watercourses are flowing. Table 4 depicts the proposed monitoring program and Figure 5 depicts the proposed surface water monitoring locations.

3.5 Exclusions to the Premises

The extraction area (quarry pit) falls outside the defined prescribed premises boundary in Schedule 1 of the Licence. The activity of quarrying on private land is regulated by the Shire of Harvey and requires approval under the *Planning and Development Act 2005*. An Extractive

Industry Licence (EIL) from the Shire of Harvey was issued for the quarry pit on 21 September 2018 (approved and detailed in Table 5).

Emissions from the quarry pit will not be authorised by this licence. However, the *Environmental Protection (Unauthorised Discharge) Regulations 2004* prohibit the discharge of specific substances including acid with pH less than 4 or more than 10, petrol, diesel, other hydrocarbons, sediment, engine coolant etc (See schedule 1 of the Regulations). The quarrying and associated activities must also comply with the *Environmental Protection (Noise) Regulations 1997*.

Table 4: Applicant's proposed surface water monitoring1

Timing	Location	Sample	Test Parameters
Autumn to Spring when water is flowing. Minimum of 4 Samples per year. If any adverse conditions or spills occur. As soon as possible following an adverse event and until the results of that event have been resolved. Prior to and during dewatering.	Green basin (M1)	Water Sample	Total Dissolved Salts (TDS) Total Suspended Sediments (TSS) Hydrocarbons pH
	Tributary draining to Roelands Community upstream of the inlet from the Green basin (M2)	Water Sample	
	Tributary draining to Roelands Community downstream of the inlet from the Green Basin (M3)	Water Sample	

Note 1: Dewatering activities (requires pre-approval from the Shire of Harvey) may occur in the pit area if water collecting in the pit exceeds storage requirements. This activity is not within the scope of this assessment as it relates to the quarry pit. Furthermore, the threshold for Category 6: Mine dewatering is not expected to be met. The *Environmental Protection (Unauthorised Discharges) Regulations 2004* apply in this case.

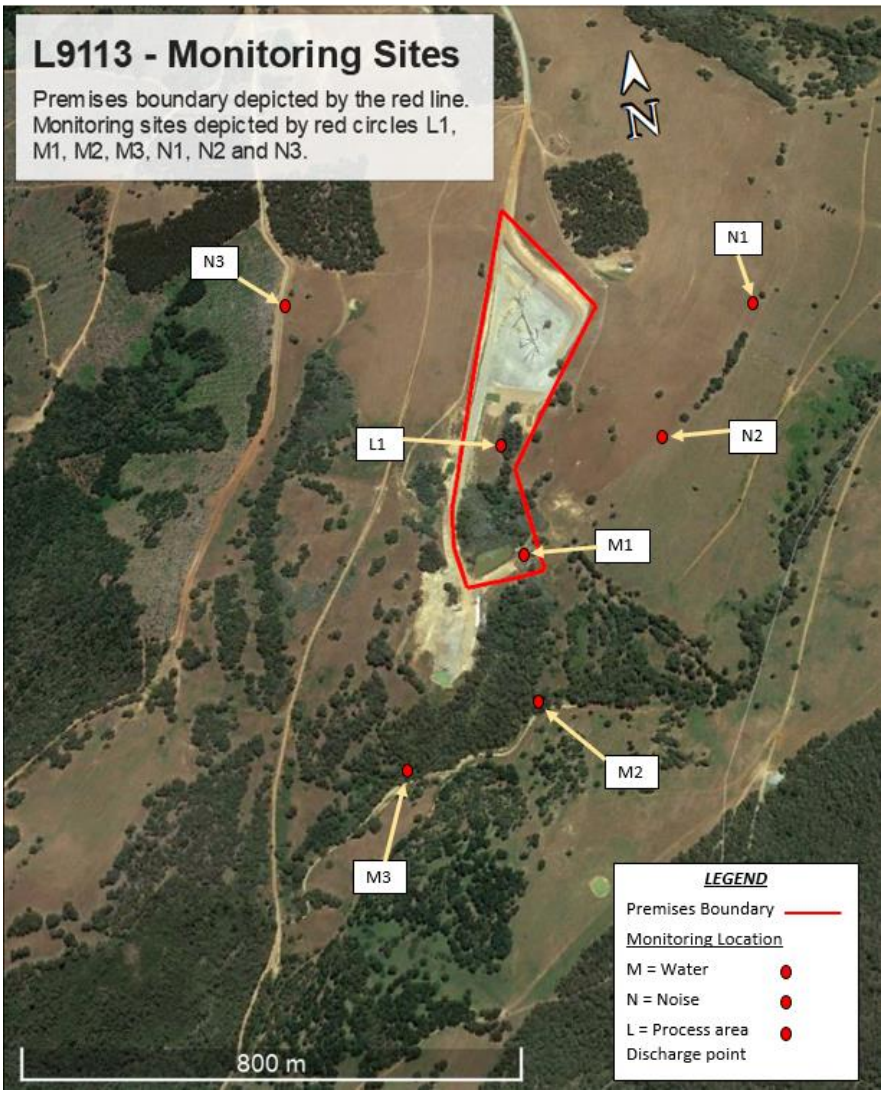


Figure 5: Applicant proposed monitoring points. Surface water are M1, M2 & M3. Noise monitoring are N1, N2 and N3.

4. Legislative context

Table 5 summarizes other approvals relevant to this assessment.

Table 5: Relevant approvals and tenure

Legislation	Number	Approval
Planning and Development Act 2005	DR 17/2016	A decision to grant development approval under the Greater Bunbury Region Scheme and the Shire of Harvey District Planning Scheme No 1 was made by SAT on 31 March 2017. The approval is valid for a period of fifteen years from the date of commencement of the EIL required by Condition 1a of the developmental approval.
Planning and Development Act 2005 & Shire of Harvey Extractive Industries Local Law.	13/29601 & 14/11545	A decision to grant the Extractive Industry Licence (EIL) was made on 21 September 2018. The approval is valid for a period of 5 years from the date of commence of the licence referred to in condition 1a of the Development Approval (Initial Period); and a further period of five years following satisfactory compliance with the conditions of planning consent.

4.1 Part IV of the EP Act

The proposal was referred to the EPA and the EPA determined that the potential impacts are not so significant as to warrant formal assessment under Part IV of the EP Act. However, public advice was given in respect to impacts on flora, inland waters and amenity via notice under section 39A(3) (CMS14037, March 2015). The public advice has been addressed by the Applicant.

4.2 Part V of the EP Act

4.2.1 Applicable regulations, standards and guidelines

The overarching legislative framework of this assessment is the EP Act and EP Regulations.

The guidance statements which inform this assessment are*:*

- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Land Use Planning (February 2017)*
- *Guidance Statement: Risk Assessments (November 2016)*
- *Guidance Statement: Environmental Siting (November 2016)*

The applicable regulations include:

- *Environmental Protection (Noise) Regulations 1997*
- *Environmental Protection (Unauthorised Discharges) Regulations 2004*

4.2.2 Clearing

Clearing of native vegetation has been undertaken at the Premises under permit number 3088/1 which was granted under section 51E part V of the EP Act on 7 September 2009 authorising Catalano to mechanically clear up to 48 native trees within Lot 501 for the gravel extraction operations. This permit expired on 3 October 2011.

Further clearing of 3 native trees in the vicinity of the processing area and clearing of up to 1.6 Ha in the quarry pit area was applied for by the Applicant. This proposal was referred to the Australian Government Minister for the Environment for assessment under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) for it was considered the clearing had the potential to impact on black cockatoos nesting habitat. On 15 December 2017 it was determined that the project was a controlled action and would require assessment and approval before the project could proceed (EPBC Act reference number 2017/8085). On 25 March 2018 the assessment and approval approach was considered under the bilateral agreement and a clearing permit 7943/1 was granted to clear three trees in the process area and 1.2 Ha of vegetation within proposed extraction pit area. This approval excluded an area of 0.4 Ha of native vegetation considered as potential black cockatoo nest trees. Clearing permit 7943/1 was issued on 3 January 2019 and expires on 3 January 2034.

Clearing of native vegetation and impacts to black cockatoos will not be considered further in the assessment of this licence application.

5. Modelling data

5.1 Noise

The noise from the extraction of material from the quarry pit and from the crushing and screening of material are regulated under the *Environmental Protection (Noise) Regulations 1997*, which is administered by DWER, a risk assessment of noise impacts from the whole

operation are considered below.

5.2 Modelling of noise emissions

Information on noise emissions has been submitted in the supporting documentation. The information submitted is as follows:

- A noise assessment was undertaken for the quarry pit and processing area (Landform September 2013);
- The original assessment of the pit and processing area (Landform September 2013) was expanded to include an assessment for the proposed residence to be located on Lot 500 Coalfields Road (Landform, August 2016); and
- Further information using the Landform August 2016 model has been provided to predict noise levels at the closest residence to the north-east, and at the eastern boundary of Lot 501 (Landform August 2017).

On 26 July 2018, further information was provided including a review of the noise bunds proposed under Works Approval W5828/2015/1 and included a revised Noise Management Plan dated May 2018. In October 2018, DWER completed a review and reassessment of the information provided on 26 July 2018 and concurs with the original conclusions.

The noise assessment for the proposed residence located on Lot 500 Coalfields Road (Landform August 2016 and 26 July 2018) is not considered in this assessment as the residence on Lot 500 has not been constructed.

Modelling has been undertaken for the following scenarios:

- Assessment of day period (0700 – 1900 hours Monday to Saturday) noise levels from operation of the quarry pit and processing plant with all plant operating at the same time; and
- Assessment of night period operations (2200 – 0700 hours Monday to Saturday) noise levels from loading and movement of trucks only.

The predicted noise levels have been provided for the following residential premises as depicted in Figure 6:

- South (Lot 28 Collie River);
- South-west (Lot 29 Seven Hills);
- West (Lot 175 Coalfields Road); and
- North-east (Lot 23 Coalfields Road).

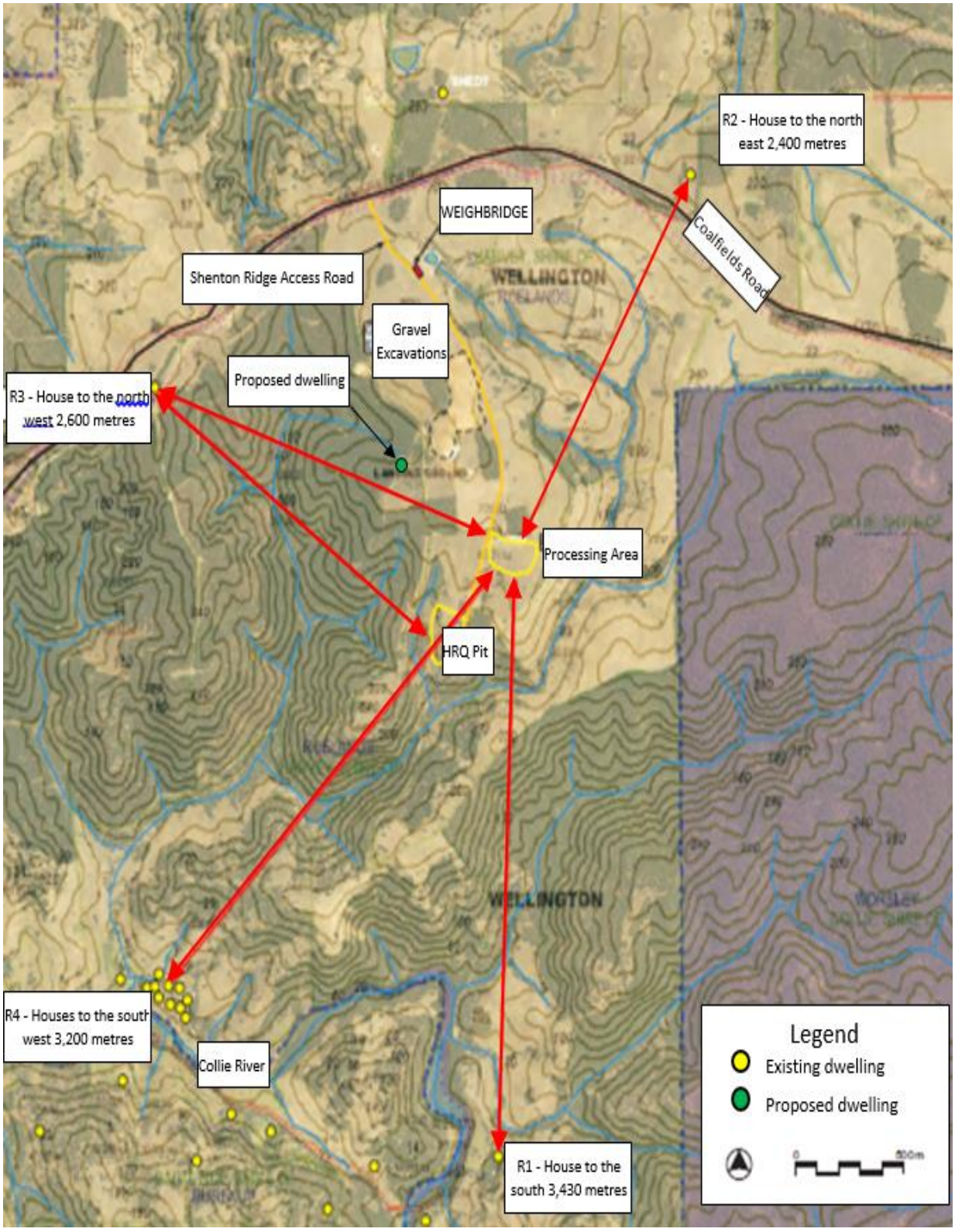


Figure 6: Map depicting the locations of residences to the south, south-west, west and north-east

The predicted noise levels for the residences located to the south, south-west, west and north-east are depicted in Table 6.

Table 6: Assessment of noise levels (day and night) from operation of the quarry pit and processing plant

Residence/Premises	Distance from processing area (m)	Day/night period	Maximum expected noise level (dB(A))	Maximum expected noise level including 5db for tonality (dB(A))	Applicable L_{A10} Assigned Noise Level (dB(A))	Expected compliance with the Noise Regulations
South (Lot 28 Collie River)	3430	Day	34	39	45	Complies
		Night	23	28	35	Complies
South-west (Lot 29 Seven Hills)	3200	Day	19	24	45	Complies
		Night	6	11	35	Complies
West (Lot 175 Coalfields Road)	2600	Day	38	43	45	Complies
		Night	28	33	35	Complies
Eastern boundary of Lot 501	50	All hours	50	55	60	Complies
North-east (Lot 23 Coalfields Road)	2400	Day	25	30	45	Complies

Key finding: The modelling indicates that the hard rock quarry processing operation is compliant with the *Environmental Protection (Noise) Regulations 1997*

Blasting operations in the Hard Rock quarry pit are regulated by the *Environmental Protection (Noise) Regulations 1997* and the conditions of the Shire of Harvey Extractive Industry Licence issued to Catalano.

5.3 Cumulative noise impacts

Noise modelling was completed for the Shenton Ridge hard rock quarry operations at the processing area and the pit. The noise modelling did not include both the hard rock quarry operations and the gravel extraction operations occurring at the same time because the accumulative impacts will only occur for a 6 to 8 week period when the gravel operation occurs. However, there is considerable separation between both operations and sensitive receptor domiciles. However, based on the predicted worst-case scenarios for modelling undertaken for both operations, the maximum expected cumulative noise level at this residence to the west located at Lot 175 Coalfields Road, is expected to comply with the assigned noise level of 45 dB(A).

As part of the compliance report for the Works Approval W5828/2015/1 the applicant has committed to measure noise emissions once normal operations at the hard rock quarry processing area commence and provide the report and any control measures proposed to the DWER for review. As such this commitment by the Applicant will be conditioned in the Licence.

6. Consultation

DWER has referred the application to the Shire of Harvey and the stakeholders identified during the Works Approval submission period. The licence application was advertised publicly in the Western Australian newspaper and on the DWER website on Monday 11 February 2019 for 28 days. A summary of comments received were provided to the Applicant who provided a response on 14 May 2019. The summary of the submissions is provided in section 6.3 and 6.4.

6.1 Shire of Harvey

Comments were received from the Shire of Harvey when the Extractive Industry Licence was issued on 21 September 2018 and following the DWER public advertising on 11 February 2019. The Shire and DWER have frequently communicated about this application on matters such as the Dust Management Plan, Noise Management Plan, Water Management Plan plus provided advice to the Shire on general matters such as nuisance noise emissions and blast vibration and water management with respects to the Shires planning approvals. Comments received from the Shire of Harvey appear in the summary provided in section 6.3 and 6.4.

An updated Water Management plan, reviewed on 6 July 2018, including addition to an updated plan of the water catchments and stormwater infrastructure (Figure 2, 3 & 4) was submitted to Shire of Harvey following final compliance report presented to DWER on 14 May 2019 for compliance with the conditions of the Extractive Industry Licence.

Upon review of the updated Water Management Plan, DWER considers the water management measure proposed for the processing area to be sound, in principle, in respects to the volumes of contaminated storm water being captured in the detention basins, plus the use of contour drains to contain run-off from the outer bund walls and slopes as a practical solution to controlling off-site impacts of potentially sediment-laden run-off. During rainfall events larger than a 1 in 10 year ARI, 2-hour duration, the overflow will be captured in secondary Green detention basins having sufficient capacity (12,963 m^3) for the entire 8.5 Ha catchment area.

6.2 Submissions received

The application was advertised in The West Australian newspaper on 11 February 2019. The following concerns were raised from the 4 submissions received:

- Inadequate buffer separation distance from the hard rock quarry to the neighbour's property boundary.
- Noise impacts upon receptors.
- Vibration from blasting causing an impact to water resources.
- Fugitive dust management.
- Longevity of the quarry.
- Cumulative noise and dust impacts from the gravel and hard rock quarry.
- Increased emissions from truck movements within the property.
- Increased safety risk due to increased traffic movements on Coalfields Highway.
- Groundwater and surface water contamination
- Sedimentation of stream and impacts upon downstream users
- Acid Sulfate Soil (ASS) disturbance causing acidification impacts.
- Lack of planning approval.
- Setting precedent for other hard rock quarry planning approvals
- Stockpile height causing dust lift-off
- Visual amenity.
- Cultural and heritage values of the Collie River.
- Impacts of blasting upon water resources that maintain the springs in the locality.
- Impacts to biodiversity including vulnerable or endangered species.

Several concerns mentioned above relate to planning and are operational matters regulated by the Shire of Harvey through the Development Approval (DA) and/or Extractive Industry Licence (EIL) issued under the *Planning and Development Act 2005* and will not be

considered in this Report.

Matters that are directly related to the emissions associated with crushing and screening works and not the quarry pit operations have been considered in this Report when determining the appropriate conditions of the Licence.

6.3 Consultation with stakeholders

DWER held a meeting with stakeholders on 25 August 2017 to discuss concerns relating to the Shenton Ridge Hard Rock Quarry. The points raised by stakeholders include:

- Sediments in creeks impacting the water supply of the downstream community.
- Sediment and soil erosion from past operations and property activities.
- Noise and blasting from the operation.
- Land use changes and potential future land rezoning issues.
- Impacts to declared and endangered species.
- Impacts to property values.
- The EIL and Works Approval should be issued at the same time.
- Impacts to groundwater levels caused by blasting operations.

Several concerns raised relate to planning matters and the quarry pit operations which are a matter for the Shire of Harvey and will not be considered in this Report.

6.4 Appeal against conditions of Works Approval W5828/2015/1

On 5 September, the Minister dismissed an appeal against the conditions of works approval W5828/2015/1 for the Shenton Ridge Granit Quarry located on Coalfields Highway between Roelands and Collie. The third party appeal raised concerns relating to impacts on surface water, flora and fauna, and the control of dust and noise emissions. The appellant submitted that these impacts were not adequately regulated by the works approval.

In his determination the Minister considered that the works approval only applies to emissions associated with crushing and screening works and that quarry pit operations and impacts from clearing of native vegetation are assessed and conditioned through planning and clearing permit approval respectively. The Minister was satisfied that the conditions of the works approval are appropriate and noted that variations to infrastructure design and location required a compliance assessment by the Department to ensure that emission risks did not increase.

7. Siting context

The Shenton Ridge Hard Rock Quarry is located approximately 24 km east of Bunbury and 24 km west of Collie in the south-west of Western Australia. The property is zoned ‘Rural’ under the Greater Bunbury Region Scheme. The quarry is located on the ridge of the Darling Scarp. Figure 6 depicts the location of the Premises in relation to sensitive receptors.

7.1 Residential Premises

The distances to residential receptors are detailed in Table 7.

Table 7: Receptors and distance from activity boundary

Residential receptors	Distance from Prescribed Activity
R1 – House located south (Lot 28 Collie River)	3430 m from the processing area

R2 – House located north-east (Lot 23 Coalfields Road)	2400 m from the processing area
R3 – House located west (Lot 175 Coalfields Road)	2600 m from the processing area
R4 – Houses located south-west (Lot 29 Seven Hills)	3200 m from the processing area
West (planned residential premises on Lot 500 Coalfields Road)[1]	800 m from the processing area

Note1: This dwelling is not yet constructed although planning approval from the Shire of Harvey was granted on 27 April 2016. The planning approval is valid for 2 years. Potential impacts on this proposed residential premises will not be risk assessed as the residence is yet to be constructed.

7.2 Specified ecosystems

Specified ecosystems are areas of high conservation value and special significance that may be impacted as a result of activities or emissions and discharges from the Premises. The distances to specified ecosystems are shown in Table 8. Table 8 also identifies the distances to other relevant ecosystem values which do not fit the definition of a specified ecosystem.

Table 8: Specified ecosystems[1]

Specified ecosystems	Distance from Prescribed Activity
Geomorphic Wetlands	500 m north (upstream)
Parks and Wildlife Managed Lands and Waters	Wellington National Park - 900 m to the east
Threatened/Priority Flora	None within a 5 km radius
Threatened/Priority Fauna	Cockatoo nesting habitat trees beside hard rock quarry pit about 250m from processing area

Note 1: Identified through a search of current publicly available geographical information system datasets in accordance with *Guidance Statement: Environmental Siting*.

7.3 Groundwater and water sources

The distances to groundwater and water sources are shown in Table 9.

Table 9: Groundwater and water sources

Groundwater and water sources	Distance from Premises	Environmental value
Collie River Irrigation District	Site within the irrigation district	Proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act).
Minor waterbody	On-site immediately west of the processing area	Drainage line that flows to a "naturalised dam" (existing man-made dam). The naturalised dam overflows to a minor perennial watercourse. The minor perennial watercourse eventually feeds into the River Collie approximately 5 km downstream.
Groundwater	Based on information from nearby bores, the depth to groundwater is expected to be at least 9 metres below ground level (mbgl). 2 bores located within the vicinity of the	The underlying groundwater is fresh.

	premises (1.6 km to the north-west and 4 km to west) have standing water levels of 9 mbgl and 18 mbgl respectively.	

7.4 Other site characteristics

The locations of other receptors are shown in Table 10.

Table 10. Other landscape features, relevant factors or receptors

Other receptors or areas of concern	Location
The Woolkabunning Kiaka Community dam. While not listed by DWER as a Public Drinking Water Source Area, the dam is used as a potable water supply by the Woolkabunning Kiaka Community.	2 km downstream of processing area.

7.5 Meteorology

7.5.1 Rainfall events

The rarity of a rainfall event can be measured by the ARI. The ARI is defined as "*the average, or expected, value of the periods between exceedances of a given rainfall total accumulated over a given duration"* (BOM website, accessed 2 January 2018).

Storm water infrastructure has been designed to contain a minimum of 2 hours' run-off resulting from a 10-year ARI rainfall event. This is consistent with DWER's Water Quality Protection Note 15 for extractive industries. The rainfall intensity for various durations and ARI for the Premises are depicted in Figure 7 as follows.

7.5.2 Rainfall Intensity-Frequency-Duration (IFD)

The ARI of rainfall events at various intensities, frequencies and durations are depicted in Figure 7. The 10 year ARI, 2 hour duration value (19.8 mm/hr) has been used to calculate the capacities of the storm water infrastructure at the Premises.

Location: 33.300S 115.900E Issued: 5/10/2017

Rainfall intensity in mm/h for various durations and Average Recurrence Interval

	Average Recurrence Interval						
Duration	1 YEAR	2 YEARS	5 YEARS	10 YEARS	20 YEARS	50 YEARS	100 YEARS
5Mins	66.8	87.5	113	131	156	192	223
6Mins	62.4	81.7	105	122	145	178	207
10Mins	49.9	65.0	82.6	94.7	112	137	158
20Mins	34.8	44.8	55.5	62.7	73.1	87.8	100
30Mins	27.6	35.4	43.2	48.4	55.9	66.6	75.5
1Hr	18.2	23.2	27.8	30.8	35.3	41.6	46.8
2Hrs	11.9	15.1	18.0	19.8	22.6	26.5	29.7
3Hrs	9.30	11.8	14.0	15.4	17.6	20.6	23.0
6Hrs	6.10	7.71	9.16	10.1	11.5	13.5	15.1
12Hrs	4.00	5.06	6.02	6.64	7.57	8.87	9.92
24Hrs	2.60	3.29	3.92	4.32	4.93	5.78	6.46
48Hrs	1.65	2.09	2.48	2.74	3.13	3.67	4.11
72Hrs	1.23	1.56	1.86	2.07	2.36	2.77	3.10

(Raw data: 23.61, 5.2, 1.61, 36.96, 8.05, 2.52, skew=0.65, F2=4.92, F50=17.99)

Figure 7. Rainfall intensity and duration for the Shenton Ridge Hard Rock Quarry

8. Risk assessment

8.1 Determination of emission, pathway and receptor

In undertaking its risk assessment, DWER will identify all potential emissions, pathways and potential receptors to establish whether there is a Risk Event which requires detailed risk assessment.

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. Where there is no actual or likely pathway and/or no receptor, the emission will be screened out and will not be considered as a Risk Event. In addition, where an emission has an actual or likely pathway and a receptor which may be adversely impacted, but that emission is regulated through other mechanisms such as Part IV of the EP Act, that emission will not be risk assessed further and will be screened out.

The identification of the sources, pathways and receptors to determine Risk Events are set out in Tables 11 and 12.

Table 11. Identification of emissions, pathway and receptors during operation

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Operation of infrastructure	Vehicle movements on unsealed access roads Loading and unloading of material stockpiles	Noise	Adjacent rural lots Residential receptors	Air / wind dispersion	Amenity impacts	Yes – refer to section 8.5	Noise causing an impact to adjacent rural lots and residential receptors during operation.
		Dust				No	The distance to receptors is considered to be too great for dust impacts to occur during operation.
	Operation of processing plant	Noise	Adjacent rural lots Residential receptors	Air / wind dispersion	Amenity impacts	Yes – refer to section 8.5	Noise causing an impact to adjacent rural lots and residential receptors.
		Dust				No	The distance to receptors is considered to be too great for dust impacts to occur.

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Operation of infrastructure		Waste: Contaminated stormwater	Surface water systems and aquatic ecosystems. Downstream water supply	Overflow of detention basins and stormwater run-off	Increased turbidity in surface water systems causing an impact to aquatic ecosystems Build-up of sediments in downstream Woolkabunning Kiaka Community dam causing an impact to the water treatment process	Yes – refer to section 8.6	Overflow of stormwater from detention basins causing increased turbidity in surface water systems.
	Use and storage of hydrocarbons / lubricants	Spills and breach of containment causing hydrocarbon/ lubricant discharge to land	Soil and vegetation adjacent to areas of spill or breach Underlying groundwater Surface water systems and aquatic ecosystems Downstream water supply	Direct discharge to land and seepage to groundwater Stormwater run-off	Soil contamination impacting vegetation growth and survival. Degradation of groundwater quality Run-off into surface water system and impacts to surface water ecosystems Degradation of water supply	Yes – refer to section 8.4	Leaks and spills causing contamination of localised soil, surface water systems and groundwater. Potential impacts to vegetation, aquatic ecosystems and downstream water supply.

8.2 Consequence and likelihood of Risk Events

A risk rating will be determined for risk events in accordance with the risk rating matrix set out in Table 13.

Table 12: Risk rating matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 14.

Table13: Risk criteria table

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
			Environment	Public health* and amenity (such as air and water quality, noise, and odour)
Almost Certain	The risk event is expected to occur in most circumstances	Severe	• **onsite impacts**: catastrophic • **offsite impacts local scale**: high level or above • **offsite impacts wider scale:** mid-level or above • Mid to long-term or permanent impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are significantly exceeded	• Loss of life • **Adverse health effects:** high level or ongoing medical treatment • Specific Consequence Criteria (for public health) are significantly exceeded • **Local scale impacts:** permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	• **onsite impacts**: high level • **offsite impacts local scale**: mid-level • **offsite impacts wider scale**: low level • Short-term impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are exceeded	• **Adverse health effects:** mid-level or frequent medical treatment • Specific Consequence Criteria (for public health) are exceeded • **Local scale impacts**: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	• **onsite impacts**: mid-level • **offsite impacts local scale**: low level • **offsite impacts wider scale**: minimal • Specific Consequence Criteria (for environment) are at risk of not being met	• **Adverse health effects:** low level or occasional medical treatment • Specific Consequence Criteria (for public health) are at risk of not being met • **Local scale impacts:** mid-level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	• **onsite impacts**: low level • **offsite impacts local scale**: minimal • **offsite impacts wider scale**: not detectable • Specific Consequence Criteria (for environment) likely to be met	• Specific Consequence Criteria (for public health) are likely to be met • **Local scale impacts:** low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	• **onsite impact**: minimal • Specific Consequence Criteria (for environment) met	• **Local scale**: minimal to amenity • Specific Consequence Criteria (for public health) met

^ Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting.*

* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines.*

"onsite**"** means within the Prescribed Premises boundary.

8.3 Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment Table 14:

Table 14: Risk treatment table

Rating of Risk Event	Acceptability	Treatment
Extreme	Unacceptable.	Risk Event will not be tolerated. DWER may refuse application.
High	May be acceptable. Subject to multiple regulatory controls.	Risk Event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
Medium	Acceptable, generally subject to regulatory controls.	Risk Event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
Low	Acceptable, generally not controlled.	Risk Event is acceptable and will generally not be subject to regulatory controls.

8.4 Risk assessment – hydrocarbons from machinery and plant operating in the process area

8.4.1 Description of Risk Event

The breach of hydrocarbon/lubricant containment potentially leading to:

- Direct discharge to land impacting soils and vegetation.
- Seepage of hydrocarbons/lubricants through the soil profile causing contamination of groundwater.
- Contamination of stormwater causing an impact to surface water ecosystems and downstream water supply.

8.4.2 Identification and general characterisation of emission

A diesel fuel tank will be located within the processing area. Other lubricating oils will also be stored in the processing area. There is to be no major servicing undertaken on site or vehicle washing facilities.

8.4.3 Description of potential adverse impact from the emission

Soil, vegetation and surface water have the potential to become contaminated with hydrocarbons in the event of leaks or spills from containment systems. Spills of hydrocarbons could contaminate stormwater which could run-off and enter surface water systems, causing an impact to the downstream water supply. Groundwater is unlikely to be impacted due to the depth to the water table (expected to be more than 9 mbgl).

8.4.4 Criteria for assessment

There is no guideline value for total recoverable hydrocarbons within the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC and ARMCANZ 2000) or the *National Environmental Protection (Assessment of Site Contamination) Measure 1999*

(ASC NEPM).

8.4.5 Applicant control

This assessment has reviewed the controls set out in Table 15.

Table 15: Applicant's proposed controls for spills of hydrocarbons

Site infrastructure	Applicant proposed controls during construction and operation
Fuel tank	Double-skinned, mobile and skid-mounted tank. Maximum of 20 m^3. Located within a bunded and lined enclosure.
Processing area	Already cleared of vegetation under permit 7943/1 issued on 3 January 2019.
Designated area for lubricating and refuelling activities	Spill kit containing absorbent granules to be located in designated area. Commitment to notify DWER and the downstream Woolkabunning Kiaka Community and the Shire of Harvey of any spill greater than 5 litres.

8.4.6 Consequence

If the breach of the hydrocarbon containment infrastructure occurs, the impact from spills and leaks of hydrocarbons at the Premises could result in minimal off-site impacts due to the low volumes stored on site. Therefore the consequence is considered to be ***minor***.

8.4.7 Likelihood of Risk Event

Based on the Applicant's proposed controls for the storage of hydrocarbons and stormwater management, the likelihood of the consequence is considered to be ***rare***.

8.4.8 Overall rating of spills of hydrocarbons during construction and operation

A comparison of the consequence and likelihood ratings described above with the Risk Rating Matrix (Table 14) has determined that the overall risk rating for spills of hydrocarbons is ***low***.

8.5 Risk assessment – noise (operation)

8.5.1 Description of Risk Event

Noise emissions from the Shenton Ridge Hard Rock operations could contribute to an exceedance of the assigned noise levels received by sensitive premises.

8.5.2 Identification and general characterisation of emission

Noise generated from the processing of extracted material, loading and unloading of material stockpiles and vehicle movement within the Premises. Table 16 contains the sound power levels for the equipment used in the modelling described in section 5.2 above.

The site is to operate as follows:

- Day period – all plant and equipment listed in Table 16 operating between the hours of 0700 to 1700 Monday to Saturday (restricted by SAT DR 17/2016); and
- Night period – 1 front end loader and 2 road trucks operating only (Landform, August 2013).

Table 16. Sound power levels of the equipment to be used at the quarry pit and processing area

Item (number of)	Sound Power Level dB(A)
Primary Crusher (1)	116
Secondary Crusher (1)	114
Tertiary Crusher (1)	114
Screens (3)	112
Generators (3)	100
Excavator (1)	109
Drill Rig (1)	121
Front End Loaders (2)	109
Articulated Truck (1)	115
Haulage Trucks (2)	104

8.5.3 Description of potential adverse impact from the emission

Noise has the potential to impact on the amenity of residential receptors. Where assigned noise levels are exceeded regularly, health impacts may arise from stress and/or loss of sleep.

8.5.4 Criteria for assessment

The modelling undertaken for the operation of the quarry pit and processing areas indicates that the assigned levels prescribed by the *Environmental Protection (Noise) Regulations 1997* can be met.

8.5.5 Applicant controls

The Applicant has not constructed the 4 metre high eastern noise bund in response to the conditions of SAT decision DR 17/2016 because the natural ridge on the eastern side of the reduced size of the processing area (2.14 Ha) now remains as a natural barrier for noise attenuation. The eastern natural ridge is 4 to 8 metres higher than the crusher and screen levels. See Figure 3 in this report.

The Applicant has committed to monitor noise emissions on the eastern and western boundary of the rural lot once normal operational condition is achieved at the hard rock quarry. The noise monitoring report will be submitted to DWER and provide the sound power monitoring and proposed control measures should 60 dB(A) be exceeded. The noise monitoring commitment will be conditioned in the Licence.

This assessment has reviewed the controls set out in Table 17 following.

Table 17: Applicant's proposed controls for operational noise

Site infrastructure	Description	Operation details	Reference to issued Licence plan
Controls for noise			
Eastern Noise bund has not been constructed because the natural ridge has been retained and the setback from the eastern neighbour's boundary has increased from 50 metres to over 200 metres.	Located on the eastern side of the processing area	Minimum of 4 metres in height	Plan of processing plant and stockpile locations within processing area.

Eastern and western boundary noise monitoring	Noise Monitoring during normal processing operations located on the eastern western boundary fence line.	Confirm sound power levels not above 60dB(A) at the boundary Confirm / propose management controls in report to DWER	Schedule 3 Monitoring Location plan at sites N1, N2 & N3

The blasting of the hard rock material within the pit is required to meet the *Environmental Protection Noise Regulation 1997* as well as being regulated by condition 6 of the Extractive Industry Licence issued to Catalano on 21 September 2018 by the Shire of Harvey.

8.5.6 Consequence

If the proposed noise monitoring of the operational activities indicates breaches of the noise above 60dB(A) at the boundary, the impacts must comply with the assigned levels prescribed in the *Environmental Protection (Noise) Regulations 1997*. There may be minimal impacts to amenity on a local scale due to the vast distances the sensitive receptor are from the operations. Therefore, the consequence rating has been determined as ***slight***.

8.5.7 Likelihood of Risk Event

Based on the Applicant's controls, impacts to amenity will probably not occur in most circumstances. Therefore, the likelihood rating has been determined as ***unlikely***.

8.5.8 Overall rating of risk of noise during operation

A comparison of the consequence and likelihood ratings described above with the Risk Rating Matrix (Table 14) has determined that the overall risk rating for noise is ***low***.

8.6 Risk assessment – stormwater run-off (operation)

8.6.1 Description of Risk Event

Release of stormwater contaminated with sediments causing high turbidity in downstream surface water systems. High turbidity could cause an impact to surface water ecosystems and the downstream water supply dam.

8.6.2 Identification and general characterisation of emission

Storm water contaminated with sediments can cause high turbidity in surface water if released to the environment.

8.6.3 Description of potential adverse impact from the emission

Sediment laden water could impact on the quality and taste of the downstream water supply. High turbidity is not toxic to aquatic fauna but can have a direct impact on the aquatic ecosystem (ANZECC/ARMCANZ 2000). High turbidity can affect light penetration and habitat quality and cause increased sedimentation to occur in areas of still water (dams, lakes etc.). The watercourse that flows to the south of Lot 501 is a tributary of the Collie River and feeds the water supply dam used by the Woolkabunning Kiaka Community.

The WMP suggests that the catchment that feeds the downstream water supply (Woolkabunning Kiaka Community dam) is comprised of an area more than 1600 hectares, and that the Shenton Ridge Hard Rock Quarry operation (pit and processing area) consists of less than 1% of this catchment (Landform, July 2017). This estimate is consistent with DWER calculations.

8.6.4 Criteria for assessment

Relevant land and freshwater quality criteria include ANZECC and ARMCANZ 2000 for fresh and marine water quality which provides guideline values for nephelometric turbidity units (NTU). The upper default guideline value for rivers in the south-west of Western Australia is 20 NTU (base conditions). The upper default guideline value for lakes, reservoirs and wetlands in the South-West of Western Australia is 200 NTU.

8.6.5 Applicant controls

The Applicant's proposed controls to manage stormwater discharges are set out in Table 18. This assessment has reviewed the controls set out in Table 18.

Table 18: Applicant's proposed controls for stormwater management

Site infrastructure	Operation details	Reference to Licence (Attachment 1)
Controls for the management of stormwater The WMP submitted provides stormwater management for both the quarry pit and processing area. The storm water infrastructure proposed for the processing area is detailed below. The proposed surface water monitoring below will reflect all waters collected in the Green Basin prior to off-site discharge.		
Perimeter bunds/batter slopes (safety bunds)	Constructed to prevent run-off entering into the processing area.	Licence Schedule 1: Site plan
Upslope cut-off drain	Cut-off drain to be constructed fit for the purpose of directing clean storm water around and away from the processing area.	
Haul road drains	Road drain design incorporated rip raps and rock pitching to slow the water flow and capture and direct contaminates into detention basins.	
Main detention basin (processing and stockpile catchment) and contingency detention basin	NW and S detention basin constructed with a minimum storage capacity of 2,512m^3 to contain a minimum of 2 hours' run-off resulting from a 1 in 10 year rainfall event. Overflow from the NW detention basin (495m^3) is directed into the S basin (2,017m^3) via constructed drains with protected outlet, prior to discharge to drainage line towards the Green Basin (~12,000m^3) (depicted in the Licence Schedule 1 Site plan).	
Western batter slope infiltration area and contingency detention basin	SW detention basin constructed with a minimum storage capacity of 1,266m^3 to contain a minimum of 2 hours' run-off resulting from a 1 in 10 year rainfall event. Overflow from the western batter area is directed towards the SW basin with protected outlet, prior to discharge to natural drainage line towards the Green Basin (depicted in the Licence Schedule 1 Site plan).	
Eastern batter slope infiltration area and contingency detention basin	SE detention basin constructed with a minimum storage capacity of 1,524m^3 to contain a minimum of 2 hours' run-off resulting from a 1 in 10 year rainfall event discharging through a protected outlet and entering the natural drainage line that flows into the Green basin (~12,000m^3).	
Maintenance of detention basins	Sediments accumulated from within all the basins will be removed to maintain the basins sizes with the recovered material spread to land or disposed to suitably authorised Premises.	

<table>
<tr><th>Site infrastructure</th><th colspan="5">Operation details</th><th>Reference to Licence (Attachment 1)</th></tr>
<tr><td colspan="7">Surface water monitoring</td></tr>
<tr><td rowspan="4">Surface water monitoring point M1, M2 and M3 as depicted in Figure 5</td><td>Timing</td><td>Location</td><td>Sample</td><td colspan="2">Test Parameters</td><td rowspan="4">Licence Schedule 3: Monitoring locations</td></tr>
<tr><td rowspan="3">Autumn to Spring when water is flowing. Minimum of 4 samples per year collected at least 30 days apart from each location.

If any adverse conditions or spills occur. As soon as practical following an adverse event and until the results of that event have been resolved.</td><td>Green Basin discharge</td><td>Water Sample</td><td colspan="2" rowspan="3">Total Dissolved Solids (TDS)

Total Suspended Solids (TSS)

Total Recoverable Hydrocarbons (TRH)

pH

Turbidity</td></tr>
<tr><td>Tributary draining to Roelands Community upstream of the flow from Green basin.</td><td>Water Sample</td></tr>
<tr><td>Tributary flowing to Roelands Community downstream of flow from Green basin.</td><td>Water Sample</td></tr>
</table>

8.6.6 Consequence

If contaminated stormwater is discharged to surface water systems, this could result in low level off-site impacts on a local scale. Therefore, the consequence has been determined as ***moderate***.

8.6.7 Likelihood of Risk Event

Based on the Applicant's proposed controls, the distance to the downstream water supply and the size of the overall catchment supplying the downstream water supply, the risk event will probably not occur in most circumstances. Therefore, the likelihood has been determined as ***unlikely***.

8.6.8 Overall rating of stormwater run-off during operation

A comparison of the consequence and likelihood ratings described above with the Risk Rating Matrix (Table 14) has determined that the overall risk rating for stormwater run-off is ***medium***.

8.7 Summary of acceptability and treatment of Risk Events

A summary of the risk assessment and the acceptability or unacceptability of the risk events set out above, with the appropriate treatment and control, are set out in Table 19. Controls are described further in section 9.

Table 19: Risk assessment summary

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	**Source**	**Pathway/ Receptor** **(Impact)**			
1.	Hydrocarbons from process area machinery and plant	Leaks from machinery Refuelling / lubricating activities Fuel storage area	Leaks and spills of hydrocarbons causing contamination of localised soils and infiltration to groundwater. Leaks and spills causing contamination of run-off and impacting surface water ecosystems and downstream water supply.	Low volumes of hydrocarbon storage (20m^3) Double skinned tank to be placed in a lined and bunded area. Designated refuelling/lubricating area with spill kits.	Minor consequence Rare likelihood **Low Risk**	Acceptable subject to proponent controls
2.	Noise	Processing equipment Vehicular movement Loading and unloading of material stockpiles	Noise causing amenity impacts to residential receptors.	Noise bund not constructed on the eastern side of the processing area. Noise monitoring assessment on eastern and western boundary of rural lots during normal operations to ensure compliance with 60 dB(A) sound power levels at the neighbours boundaries.	Slight consequence Unlikely **Low risk**	Acceptable subject to proponent controls
3.	Stormwater run-off	Material processing and stockpile areas Infrastructure drainage	Overflow of stormwater containment infrastructure to surface water systems causing impacts to surface water ecosystems and the downstream water supply.	Clean stormwater directed around and away from the processing area. Storm water infrastructure designed to contain a minimum of 2 hours' run-off resulting from a 10 year ARI rainfall event. Detention basins maintain a 2m vertical separation from groundwater at the Premises.	Moderate consequence Unlikely likelihood **Medium Risk**	Acceptable subject to proponent controls plus regulatory controls

9. Regulatory controls

The risks are set out in the assessment in section 8 and the regulatory controls are detailed in this section by having regard to the adequacy of controls proposed by the Applicant, comments and submissions provided by the community and current approvals granted by other authorities plus the Ministers for Environment Works Approval appeal determination. The conditions of the Licence will be set to give effect to these controls.

9.1 Licence controls

The provision, operation and maintenance of the specified infrastructure and controls outlined in section 9.1 are considered necessary to manage risks as assessed in section 8.

In accordance with the Guidance Statement: *Risk Assessments,* DWER has had regard for the Applicant's proposed controls, and where they lower the assessed likelihood or consequence of a Risk Event, these controls will be conditioned in the Licence.

These controls, which are based on the Applicant's commitments in the Application, will be included in the issued Licence as specified infrastructure that was constructed.

The Works Approval appeal determination by the Minister resulted in significant changes to the Noise controls, Stormwater controls and constructed infrastructure that has been reassessed in this report and reflected by Licence conditions.

9.1.1 Hydrocarbon infrastructure

The Applicant's commitments have been conditioned for the hydrocarbon infrastructure (Table 20) to manage the risk of spills and leaks from the storage area by ensuring the requirements are identified in Condition 2 Table 3 of the Licence:

Table 20: Infrastructure requirements to manage leaks and spills of hydrocarbons during operation

Site infrastructure	Requirements (design and construction)
Fuel tank	Located within the processing area. Double skinned, mobile skid mounted tank. Maximum of 20 m^3. Located within a bunded and lined enclosure.
Designated area for lubricating and refuelling activities	Spill kit containing absorbing granules to be located in designated area. Commitment to notify DWER and the downstream Woolkabunning Kiaka Community and the Shire of Harvey of any spills greater than 5 litres.

9.1.2 Noise infrastructure

The Applicant's commitments have been conditioned in the issued Licence to include the monitoring of noise emissions on the eastern and western boundary of the rural lots once normal operational conditions is achieved at the hard rock quarry because the eastern noise barrier was not constructed as the natural ridge provides a 4 to 8 metre barrier. The resizing of the processing area as an outcome of the Ministers appeal determination resulted in the separation distance from the rural boundaries increased from 50m initially to over 200m whilst retaining the natural ridge which is considered suitable for noise attenuation. The western noise barrier has not been constructed as it is not required until the proposed residence for Lot 500 has commenced building. This will be tested by noise monitoring being conducted.

A noise monitoring report will be submitted to DWER and provide sound power monitoring and

proposed control measures should 60dB(A) be exceeded at the boundary in line with the Applicants commitments. The monitoring locations have been expanded by DWER to include monitoring on the western boundary of Lot 501.

9.1.3 Stormwater infrastructure

The Applicant's commitments have been conditioned in the issued Licence to include the Ministers appeal determination by accepting a reduced size of the processing area, stormwater infrastructure redesign as reassessed in this Report. Further regulatory controls have been applied to the western batter slope catchment (Engineering assessment by GHD) and redesign of haul road drainage to ensure sediment in the road drains is adequately managed and directly all stormwater through the larger Green basin prior to water discharging from the property.

The stormwater infrastructure and controls are described in Table 18 of this report and is replicated in the Licence condition 2 Table 3 requiring it be maintained fit for purpose.

The capacity of each detention basin has been adequately sized to contain a minimum of 2 hours' run-off resulting from a 1 in 10 year rainfall event. All perimeter bunds/batter slopes and noise bunds have been compacted to prevent material loss during rainfall events and rip raps included within the drains to reduce storm water velocity. This will reduce the likelihood of overflow being discharged on to neighbouring land. The requirement to maintain a 2 m separation distance between the base of each detention basin and groundwater has been achieved which is consistent with WQPN 15 for Extractive Industries.

9.1.4 Monitoring requirements for stormwater run-off

A condition in the Licence will require water monitoring in the event when there is overflow from the South basin which is the authorised discharge point for water flowing from the processing area. Exceedance trigger level for Turbidity has been set for the South basin and downstream sample points M2 and M3 which are consistent with the default guideline values for lakes, reservoirs and wetlands and rivers in south-west Australia in ANZECC/ARMCANZ 2000. Daily field test monitoring for turbidity is proposed when crushing and screening operations occur and whilst water discharges from the South basin. The daily field test will be expanded to include M2 and M3 when the turbidity test at L1 is greater than 100 NTU. The daily monitoring will be completed during the first winter season once the licence is issued and the results reviewed by the department.

A turbidity management action exceedance has been set when daily turbidity results from M3 exceed the results from M2 by 20%. The management action is further discussed in section 9.1.5.

The Applicant's commitment to monitor four (4) times during Autumn to Spring has been captured under the same condition for parameters of pH, TDS, TSS, Total Recoverable Hydrocarbon and Turbidity at the Green basin and sample locations M2 and M3 (Figure 8).

The surface water monitoring requirements during operations is shown in Table 21 as follows.

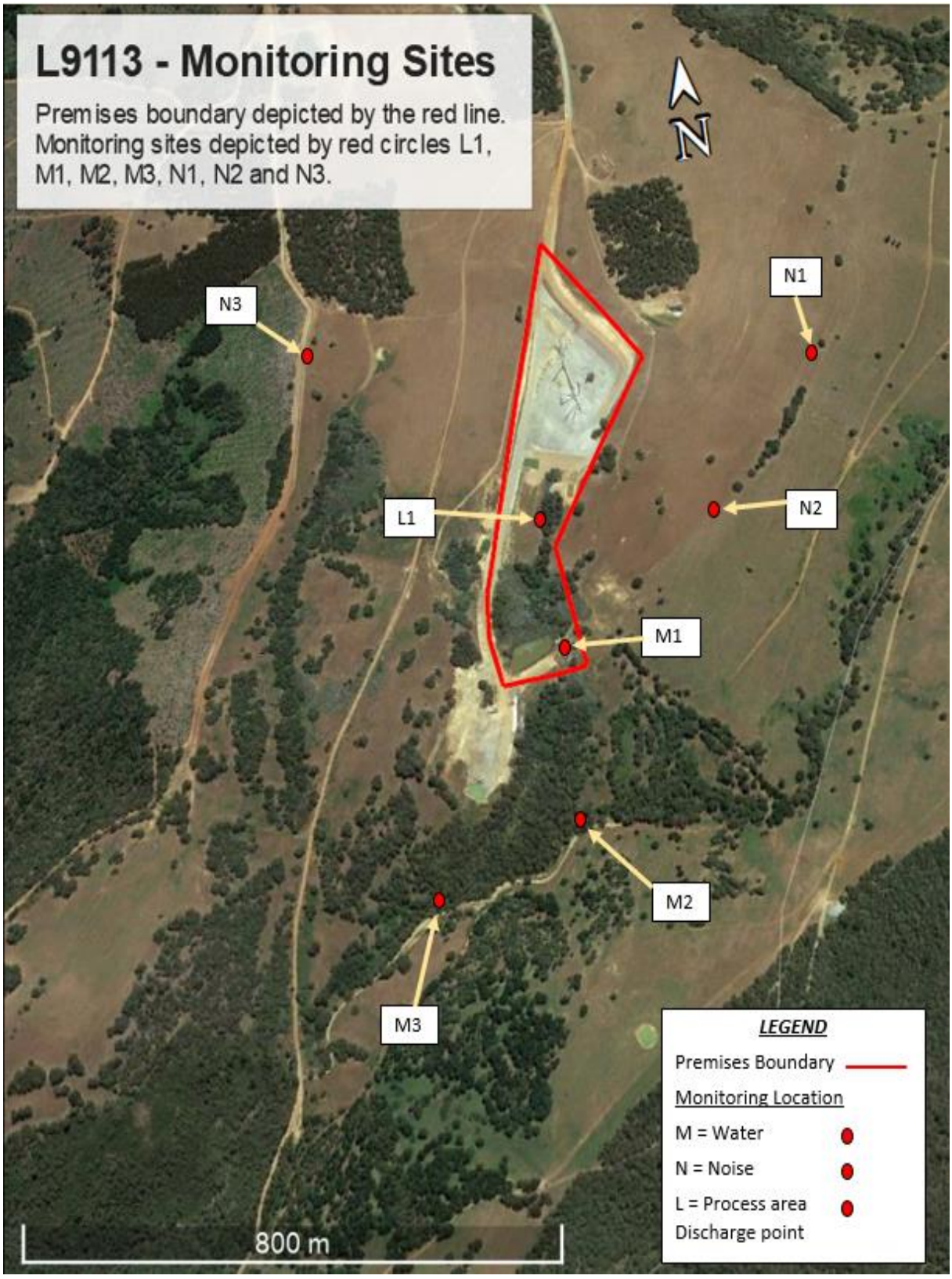
Table 21: Surface water monitoring requirements

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Monitoring Point	**Parameter**	**Frequency**	**Averaging period**	**Unit**	**Method**
M1, M2 and M3.	pH	4 times per year, collected at least 30 days apart, spaced across the winter months of the Annual Period and following first 100mm of rainfall received at the Premises.	Spot samples	-	AS/NZS 5667.1 and AN/NZS 5667.10
	Total Suspended Solids (TSS)			mg/L	
	Total Dissolved Solids (TDS)			mg/L	
	Total Recoverable Hydrocarbons			µg/L	
	Turbidity			NTU	
L1	Turbidity	Daily when water discharge occurs from Southern Basin. *(1)*	Field test samples	NTU	AS/NZS 5667.10
M2 & M3	Turbidity	Daily, when L1 Turbidity field test result exceeds 100 NTU.	Field Test Sample	NTU	AS/NZS 5667.10

(1) The daily turbidity monitoring from L1 will be carried during the first 12 months after the licence is issued or as otherwise required by the CEO.

A plan of surface water monitoring sites is included in the Licence as depicted by Figure 8.

Figure 8: Plan of the noise, surface water monitoring and approved discharge point.



9.1.5 Turbidity management actions

A condition will be added to the Licence that will require management actions reflected by Table 22 below, and describes the actions to be undertaken by the Licence Holder in the event that daily turbidity trigger level of 100 NTU is exceeded at the authorised discharge point (L1) and same day sampling of turbidity results in NTU's from sample location M3 exceed the results from M2 by 20% (NTU's). Once 20% variation in turbidity is reached then Management Actions to inspect storm water infrastructure for failure and immediately repair and/or reduce discharges from the South Basin are to be completed. It is noted that after water discharges from the South Basin it still has to pass through the large Green basin prior to release.

Should the 20% variation in daily turbidity readings occur for 10 consecutive days then the licence Holder will be required to notify the Department within 24 hours to address additional detention areas or other alternative controls to be approved.

Field test sampling for pH and Turbidity will be completed to Australian Standards with in-situ meters that have a calibrated accuracy of plus or minus 5% and 3% respectively.

The actions proposed will reduce the likelihood of highly turbid water from the processing area reaching the southern stream and into the downstream water supply dam.

Table 22 Turbidity Management Actions

Exceedance event	Action
1. Turbidity measurement at M3 is 20% greater than turbidity measurement at M2.	Immediately inspect stormwater infrastructure for failure and management, and repair / rectify immediately. Reduce discharge from South Basin.
2. 10 consecutive daily turbidity measurements at M3 exceed by 20% the daily turbidity measurement at M2.	Additional detention areas are required to be constructed or other actions taken as approved by DWER. Notify the DWER within 24 hours following the 10th consecutive daily turbidity exceedance.

The daily monitoring of pH and Turbidity from L1, M2 & M3 will be annually reviewed following receipt of the Annual Report.

10. Determination of Works Approval conditions

The conditions in the issued Licence in Attachment 1 have been determined in accordance with the *Guidance Statement: Setting Conditions*.

The issued Licence will expire in line with the SAT decision and Extractive Industry Licence issued by the Shire of Harvey being 21/09/2023.

Table 23 provides a summary of the conditions to be applied to this Licence.

Table 23: Summary of conditions to be applied

Condition Ref	Grounds
Emissions 1	These conditions are valid, risk-based and contain appropriate controls.
Infrastructure and Equipment 2	These conditions are valid, risk-based and contain appropriate controls.
Raw material throughput restrictions 3 and 4	These conditions are valid, risk-based and contain appropriate controls.
Stockpile Management 5 and 6	These conditions are valid, risk-based and contain appropriate controls.

Noise management 7, 8 and 9	These conditions are valid, risk-based and contain monitoring and reporting requirements.
Contaminated Stormwater management 10, 11 and 12	These conditions are valid, risk-based and contain appropriate controls.
Emissions Monitoring 13, 14, 15, 16, 17 and 18	These conditions are valid, risk-based and contain monitoring specifications.
Record keeping 19, 20 and 21	These conditions are valid and are necessary administration and reporting requirements to ensure compliance.

DWER notes that it may review the appropriateness and adequacy of controls at any time and that, following a review, DWER may initiate amendments to the Licence under the EP Act.

11. Applicant's comments

The Applicant was provided with the draft Decision Report plus draft Licence on 22 July 2019 and 9 August 2019.

The Applicant provided a response on 24 & 26 July 2019 plus 12 and 14 August 2019 requesting corrections to the draft Decision Report and Licence. The changes included the exceedance limits and targets on the water quality parameters and the water monitoring locations. A comparison of monitoring location M2 and M3 parameter being exceeded and the ramification for monitoring locations L1 or M1 were raised and resolved by amending Condition 17 of the Licence. A Turbidity management action condition was included in the licence following a review of the original Works Approval decision report plus appeal documents provided in September 2018 appeal report. Some grammatical changes were proposed to provide clarity of this report. Discussion ensued regarding the daily Turbidity monitoring, the requirements for pH monitoring and the amount of time that daily monitoring should occur. These requirements have been addressed in emissions monitoring conditions 15 Table 7.

The Applicant also indicated that the detention basins constructed within the processing area where surveyed to allow accurately basin capacities to be established.

Furthermore, the Applicant committed to conduct noise monitoring to assess that the eastern natural ridge provide the necessary noise attenuation to achieve 60 dB(A) at the eastern boundary. Noise monitoring was also proposed on the western boundary with the view of providing an assessment of the operational noise and determine the feasibility of a western noise bund or other management controls should the proposed residence on Lot 500 commence construction. This was reflected in conditions 7, 8 & 9.

If any changes to the Licence are proposed once it is authorised, the Applicant will be required to submit an application for an amendment to the Licence. Any changes will be reassessed where appropriate.

12. Conclusion

This assessment of the risks of activities on the Premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this Decision Report.

Based on this assessment, it has been determined that the licence will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

Tim Gentle

Digitally signed by Tim Gentle
Date: 2019.08.21 14:39:32 +08'00'

Tim Gentle
MANAGER – RESOURCE INDUSTRIES
Delegated Officer
under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key documents

	Document title	In text ref	Availability
1.	Landform Research, August 2013. *Excavation and Rehabilitation Management Plan – Proposed Hard Rock Quarry "Shenton Ridge" Lot 501 Coalfields Road, Wellington*	Landform August 2013	DWER record A868181
2.	Landform Research, September 2013. *Proposed Hard Rock Quarry "Shenton Ridge" Lot 501 Coalfields Road, Wellington Noise Assessment*	Landform September 2013	DWER records A868187
3.	Landform Research, August 2016. *Proposed Hard Rock Quarry "Shenton Ridge" Lot 501 Coalfields Road, Wellington Noise Assessment*	Landform, August 2016	DWER records A1176219
4.	Landform Research, July 2017. Water Management Plan – Proposed Hard Rock Quarry "Shenton Ridge" Lot 501 Coalfields Road Wellington	Landform, July 2017	DWER records A1520945
5.	Email from Landform Research, 16 August 2016 3:14 PM. *Catalano Shenton Ridge Hard Rock Quarry – Works Approval W5828/2015/1*	Landform, August 2017	DWER records A1532782
6.	Email from Landform Research, 13 April 2016 11:06 AM. Catalano's Hard Rock Quarry W5828/2015/1	Landform April 2017	DWER records A1532787
7.	Email from Landform Research, 15 November 2017 5:43 PM. Concept water management processing and stockpile area	Landform, November 2017	DWER record A1520945
8.	Public advice under section 39A(7) EP Act 1986 – Hard Rock Quarry, Lot 501 Coalfields Road, Wellington	CMS 14037, March 2015	Accessed at www.epa.wa.gov.au
9.	Australian Bureau of Meteorology	BOM website	Accessed at www.bom.gov.au
10.	Water Quality Protection Note 15: Extractive Industries near sensitive	Water Quality Protection	Accessed at www.water.wa.gov.au

	water resources	Note 15	
11.	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	DWER Guidance Statement	Accessed at www.dwer.wa.gov.au intranet.
12.	DER, August 2016. *Guidance Statement: Licence duration.* Department of Environment Regulation, Perth.		
13.	DER, November 2016. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.		
14.	DER, November 2016. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.		
15.	Catalano document dated 25 July 2018 titled "*Compliance to Conditions of Works Approval".*	Compliance Report	DWER record A1725285
16.	Catalano document dated 18 January 2019 titled *"Response to DWER letter dated 19 December 2018".*	Compliance Report	DWER record A1756771
17.	Catalano document dated 14 May 2019 titled *"Catalano Shenton Note to DWER 2019-05-12 Report".*	Compliance Report	DWER record A1788394

Attachment 1: Issued Licence L9113/2018/1