



Application for Works Approval

Division 3, Part V *Environmental Protection Act 1986*

Works Approval Number	W6391/2020/1
Works Approval Holder	Simcoa Operations Pty Ltd
ACN	009 064 653
File Number	DER2020/000164
Premises	Moora Quartzite Mine M70/191, G70/91, G70/92, G70/93, M70/1292 MOORA, WA 6512
Date of Report	07 08 2020
Status of Report	Final

1. Definitions of terms and acronyms

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

Table 1: Definitions

Term	Definition
ACN	Australian Company Number
Applicant	Simcoa Operations Pty Ltd
Category/ Categories/ Cat.	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
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 <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DMIRS	Department of Mines, Industry Regulation and Safety
DWER	Department of Water and Environmental Regulation As of 1 July 2017, the Department of Environment Regulation (DER), the Office of the Environmental Protection Authority (OEPA) and the Department of Water (DoW) amalgamated to form the Department of Water and Environmental Regulation (DWER). DWER was established under section 35 of the <i>Public Sector Management Act 1994</i> and is responsible for the administration of the <i>Environmental Protection Act 1986</i> along with other legislation.
EPA	Environmental Protection Authority
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of, and during this Review
Minister	the Minister responsible for the EP Act and associated regulations
MS	Ministerial Statement
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
Review	this Licence review
Revised Licence	the amended Licence issued under Part V, Division 3 of the EP Act following the finalisation of this Review.
Risk Event	As described in <i>Guidance Statement: Risk Assessment</i>
RIWI Act	<i>Rights in Water and Irrigation Act 1914 (WA)</i>
UDR	<i>Environmental Protection (Unauthorised Discharges) Regulations 2004 (WA)</i>
Works Approval Holder	Simcoa Operations Pty Ltd

2. Purpose and scope of assessment

2.1 Application details

Simcoa Operations Pty Ltd (Simcoa) submitted an application with supporting documents (Application) on 3 April 2020 to the Department of Water and Environmental Regulation (DWER) for a works approval under the *Environmental Protection Act 1986* (EP Act).

Simcoa is proposing to dewater two open pits (Main and West Pits) to enable mining below the current water table. The current water table is at approximately 215 to 216 m AHD and the proposed mining plan involves progressive excavation of Main and West Pits to a final depth of approximately 165 m AHD (approximately 23 to 24 mbgl). Mine dewatering will be achieved through in-pit pumping. The proposed design capacity is 3,000 m³/day up to a maximum of 250,000 kL per annum.

Simcoa's existing prescribed premises boundary includes tenements M70/191, G70/91, G70/92 and G70/93. The Project will be located on M70/191 and part of M70/1292. The dewatering pipeline will extend from Main and West Pits located on M70/191 to the discharge point at Kyaka Brook Creek located adjacent to M70/1292. Simcoa is the registered lease holder on ML70/191 and has a land owner agreement in place for the part of M70/1292 that forms part of the new prescribed premises.

The pipeline will largely follow a cleared, disused access track and extend along the northern boundary of M70/191 (on the southern side of Kyaka Road) to reach the discharge point at Kyaka Brook Creek. The dewatering pipeline and discharge point will extend outside of the existing prescribed premises boundary. The new prescribed premises boundary will include tenements M70/191, G70/91, G70/92, G70/93 and part of M70/1292.

Table 2 lists the prescribed premises category that has been applied for.

Table 2: Prescribed Premises Category

Classification of Premises	Description	Assessed Production
Category 6	Mine dewatering: premises on which water is extracted and discharged into the environment to allow mining of ore.	250,000 tonnes per year

2.2 Scope of Assessment

This Decision Report assesses emissions and discharges associated with construction of the works and time limited operations of the proposed category 6 dewatering.

This assessment has resulted in the Department of Water and Environmental Regulation issuing works approval W6391/2020/1 which is contained in Attachment 1.

2.3 Background - licence

Simcoa currently holds licence L6149/1988/8 for the prescribed premises categories listed in Table 3.

Table 3: Existing licence L6149/1988/8

Prescribed Premises Category	Description
05	Processing or beneficiation of metallic or non-metallic ore

The existing L6149/1988/8 Premises is defined by the boundaries of tenements M70/191, G70/91, G70/92 and G70/93 but does not include the dewater discharge point.

For ongoing operation of the proposed dewatering beyond the approved time limited operations, an amendment to the licence will be required for addition of category 6, and the premises boundary expanded to include part of tenement M70/1292.

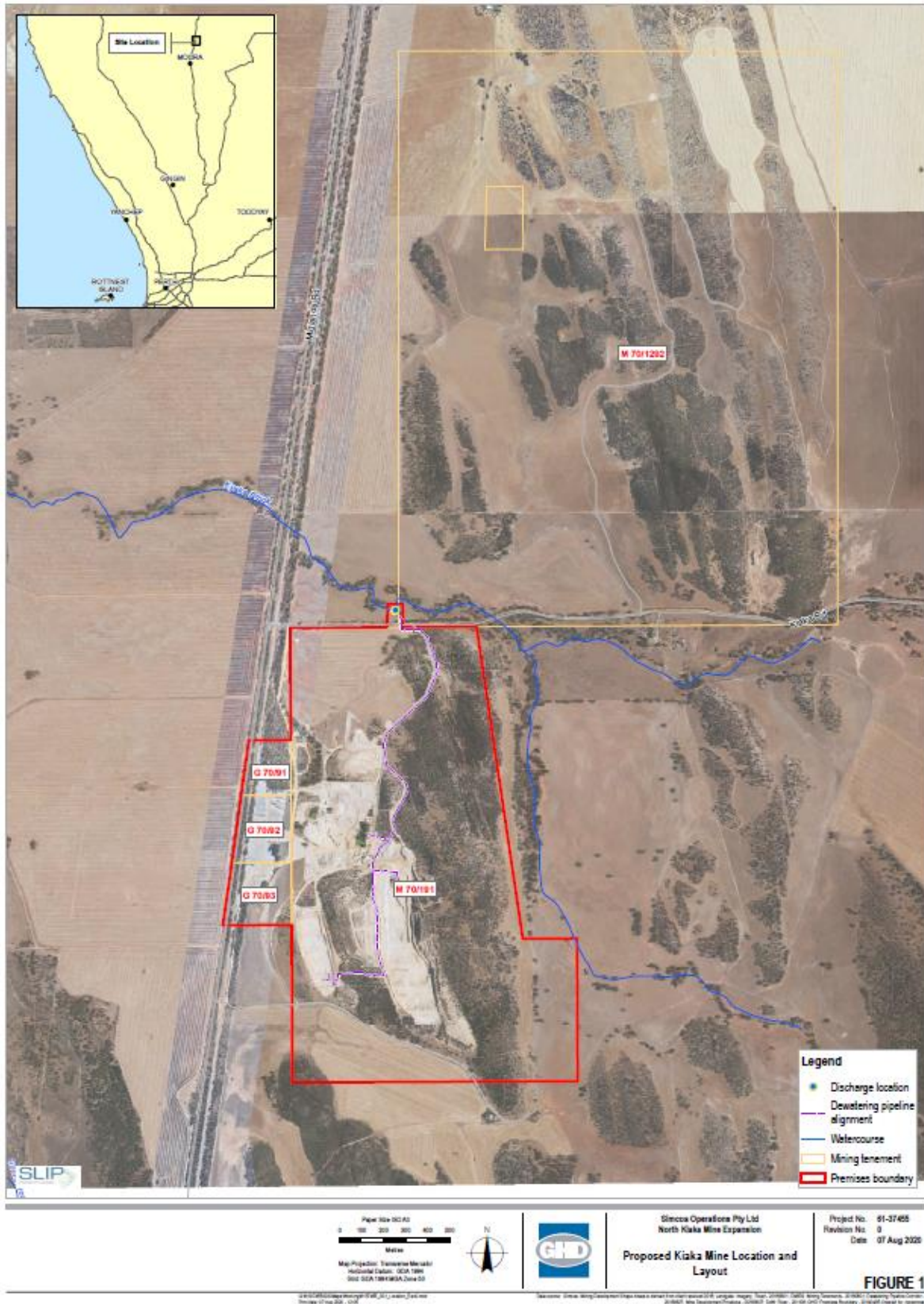


Figure 1: Premises Location

3. Overview of the proposal

Simcoa is proposing to dewater two open pits (Main and West Pits) to enable mining below the current water table. The current water table is at approximately 215 to 216 m AHD and the proposed mining plan involves progressive excavation of Main and West Pits to a final depth of approximately 165 m AHD (approximately 23 to 24 mbgl). The mine dewatering system will consist of submersible pumps and diesel generators that will pump water from a bore located at the bottom of Main Pit and in-pit sumps in West Pit. Groundwater will be pumped out of the pit areas via a pipeline to a water tank located on Eastern Ridge. Prior to reaching the water tank, water can be diverted to an onsite water storage pond to enable re-use. Surplus dewater is to be disposed of into a nearby creek (Kyaka Brook Creek) via an overflow pipeline. The proposed design capacity is 3,000 m³/day up to a maximum of 250,000 kL per annum.

3.1 Works

3.1.1 Pumping

Electro-submersible pumps (one per pit) will be installed in Main and West Pits with power supply to the pumps via portable diesel fuel generators with auto-start capability. It is anticipated the pumps will have similar specifications to Grundfos SP95-9.

Bore BH2 has been constructed in the base of Main Pit, with 200 mm Nominal Diameter (ND) steel casing to a depth of 28.34 mbgl. BH2 was drilled and completed in October 2011 and has been designed to pump at suitably high rates in order to enable dewatering. A cumulative flow meter is installed on BH2.

In-pit pumping in West Pit will be via excavated sumps located at the bottom of the pit. A flow meter will be installed at the in-pit sumps to enable water volumes to be recorded.

3.1.2 Pipeline

The dewatering pipeline will extend approximately 2.4 km from Main Pit and West Pit to the discharge location at Kyaka Brook Creek. The pipeline will have a diversion to the onsite water storage pond to enable re-use of dewater for dust suppression, ore beneficiation and road watering activities. The proposed pipeline will be two multiple polyethylene 110 mm pipes (DN140 PE100). Water flow meters will be placed on the water lines to enable water usage to be determined.

The pipelines will be laid loose on the ground and bedded with silt fines to prevent damage and movement.

3.1.3 Water tank and standpipe

The proposed water holding tank will be located on a sand pad on Eastern Ridge. The tank will have a maximum volume of 400,000L. The tank will be fitted with a bottom outlet to allow for offsite reuse of dewater.

A standpipe will be installed along the mine access road to allow for offsite use of dewater by local pastoralists and the Shire of Moora. The standpipe will be the portable skid type, of steel construction and will be placed on an area of compacted gravel without bunding.

3.1.4 Discharge point

The dewater discharge point will be located within Kyaka Brook Creek. Rock pitching will be installed in the Brook to dissipate energy from the discharge.

3.2 Operations

3.2.1 Dewatering

Saprolite Environmental (Saprolite) completed a test pumping programme at the Mine in 2011. Based on the results of the test pumping, Saprolite (2012) estimated abstraction volumes ranging from 64,000 to 121,000 kL/annum to dewater the Main Pit. Saprolite (2012) estimated that 64,000 kL/annum would be required to maintain the dewatered water level and 121,000 kL/annum would result from initial dewatering and instantaneous flows. The maximum draw from dewatering bore BH2 will not exceed 3,000 kL/d and will be pumped at or below calculated maximum yields. BH2 may be pumped at maximum rates (2,500 to 2,800 kL/day) for 3 to 4 weeks every second year to achieve the required mine dewatering and at lesser rates (1,700 to 2,500 kL/day) for 4 to 6 weeks every year to maintain water levels at required levels.

Given that West Pit is located within 500 m of BH2, dewatering within Main Pit may potentially dewater West Pit to some extent. The Saprolite report found that West Pit is not expected to contain significant fracturing, therefore it is expected that separate dewatering will be required within West Pit using excavated in-pit sumps. Dewatering volumes from West Pit was estimated using the pit area and required drawdown response (4 m every second year). Assuming a relatively low specific yield of 2.5%, the dewater volume was estimated at 12,250 kL (Saprolite 2012).

Once dewatering commences, mining within the pits will progress in 4 m benches. As required, the pump from BH2 will be temporarily removed and bore casing reduced/removed to the level of the mining bench. The pump would then be reinstalled.

3.2.2 Mine dewater reuse

Reuse of dewater from BH2 and West Pit will be undertaken in line with the 2013 *Department of Water's Strategic policy 2.09: Use of Mine Dewatering Surplus (2013)*:

- Pumped to onsite water storage pond and reused within the Mine for ore beneficiation, dust suppression and road watering.
- Pumped to water holding tank (and standpipe) and made available for offsite reuse by local pastoralists and the Shire of Moora.
- Surplus dewater discharged into Kyaka Brook Creek.

The site plan showing the pit locations, pipeline route and related infrastructure is shown in Figure 2 below.

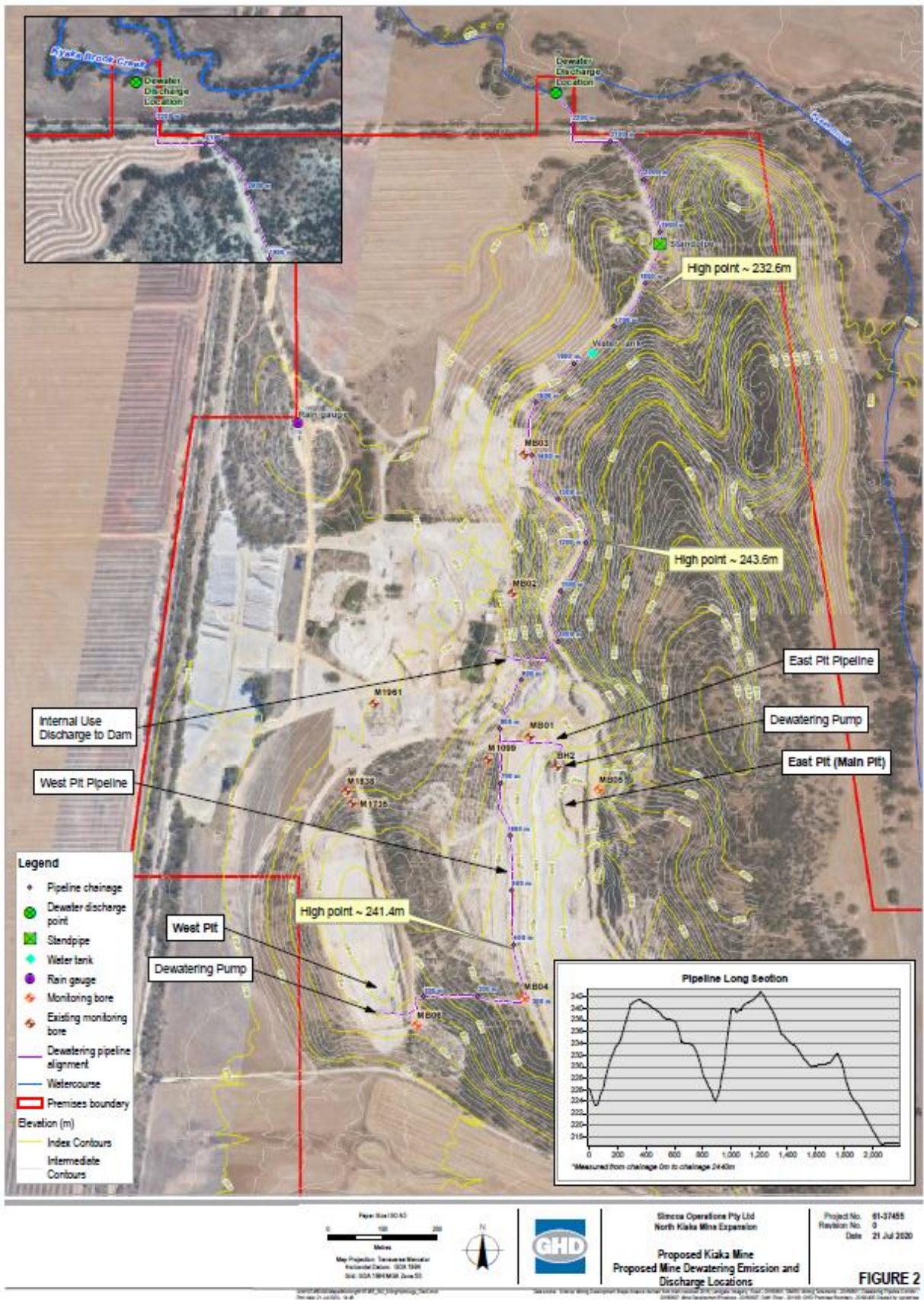


Figure 2: Site Plan

4. Location and siting

4.1 Siting context

The premises is located in a broad agriculture area approximately 15 km north of Moora in the Wheatbelt region of Western Australia (WA).

4.1.1 Geology

The mine is situated within the Noondine Chert stratigraphic unit, located to the east of the Darling Fault (Carter and Lipple 1982). The Noondine Chert consists of bedded chert, orthoquartzite, chert breccia, silicified limestone and dolomite and contains significant siliceous sandstone and minor claystone. The chert is almost pure in silica but contains contaminants such as iron oxides, clays, apatite, chlorite, pyrite and remnant carbonates. Titanium oxides, iron oxides and clays occurring within the surface of the chert are due to secondary weathering processes. The sedimentary rocks are intruded by dolerite dykes and broken up by strike and transverse faults (Saprolite 2012).

Three landform / soil associations occur within the Mine area: (i) alluvial plains, (ii) midslope rises adjacent to drainage lines and valleys, and (iii) moderately inclined hill slopes and crests. Soils at the mine site consist of loamy-earths, clays and minor sandy-earths. The mine site is characterised by shallow soils, especially on the hill slopes. Midslope areas generally exhibit shallow soils of red sandy earth and red shallow loam. Soils are generally absent on the hill slopes and crests (Mine Earth 2018).

4.1.2 Acid sulfate soils

The premises is within an area that has a low probability (6-70% chance of occurrence) to extremely low probability (1-5% chance of occurrence in small localised areas) of ASS occurrence.

4.1.3 Hydrogeology

The hydrogeology of the Moora region can be divided into surficial and fractured rock aquifers with the Leederville aquifer formation found along the western edge of the Moora region (Department of Water (DoW) 2009). The surficial formation, composed of sand, silt and clay, forms a localised colluvial and alluvial lens over the underlying formations (DoW 2009). The surficial aquifer ranges from saturated to unsaturated across the Moora region with water quality ranging from fresh to brackish (Saprolite 2012). The standing water level of the surficial aquifer in the vicinity of the Premises is between 11 m and 22 m below ground level.

The Leederville aquifer formation, found only south-west of the Darling Scarp, is overlain by the Dandaragan sandstone formation and underlain by the Parmelia formation (DoW 2009). The aquifer is composed of interbedded sandstone, siltstone and shale. Water quality within the Leederville aquifer is essentially fresh (Saprolite 2012).

Unconfined aquifers may be found within open saturated fractures of the Noondine Chert (DoW 2009). These unconfined formations are collectively referred to as fractured rock aquifers. The hydrogeology of the fractured rock aquifer is highly variable with groundwater quality ranging from brackish to saline. Aquifer recharge is limited to minor infiltration of rainwater into the connected fracture systems near the land surface. Groundwater quantity of fractured rock aquifers are highly variable, although relatively large supplies of low salinity groundwater may be obtained from the Noondine Chert (Saprolite 2012).

Groundwater exploration and test production bore drilling was completed by Saprolite in 2011 (Saprolite 2012). A water level survey confirmed that the potentiometric level was at the expected elevation of 215/216 m AHD. Based on the depth of water occurrence being the

interpreted top of the fractured rock aquifer and the measured water depth, it was interpreted that the aquifer encountered was confined to semiconfined with a confining layer of unsaturated quartz of lower hydraulic conductivity (Saprolite 2012).

Monitoring undertaken at the Premises shows a pattern of an aquifer that is directly affected by rainfall, with rising water levels post winter and falling water levels in summer (Saprolite 2012).

4.2 Residential receptors

The distance to the closest sensitive residential receptor is 1,200 m from the discharge location.

Due to the distance from potential emissions to the receptor during construction and operation for the dewatering, residential receptors are not considered a sensitive receptor for this assessment.

4.3 Specified ecosystems

Environmentally Sensitive Areas (ESA's) exist across the Premises. The ESA's are associated with the presence of Threatened flora species that occur on ridges and slopes of chert hills of the Coomberdale Floristic Region and with eucalypt woodlands of the Western Australian Wheatbelt.

4.4 Ecology

4.4.1 Vegetation and Flora

Native vegetation within M70/191 is largely associated with Eastern Ridge which occurs on the eastern side of the tenement. The vegetation fringing Kyaka Brook Creek at the discharge location consists of *Casuarina obesa* and *Eucalyptus loxophleba* subsp. *loxophleba* trees over a sparse understorey dominated by introduced grasses and herbs (actis 2011). The *Native Revegetation Guide for the Moore River Catchment* list the vegetation species in this area as being water logging tolerant.

The vegetation condition within M70/191 ranged from excellent to poor. The majority of the tenement (in areas of native vegetation) was rated good or better. Grazing pressure was more evident in native vegetation at the southern end of the tenement (southern end of Easter Ridge) (Trudgen 2012).

Three species listed as Threatened (Declared Rare) under the *Biodiversity Conservation Act 2016* (BC Act) have been recorded within M70/191, *Acacia aristulata*, *Daviesii dielsii* and *Goodenia arthrotricha*. Three species listed as Priority by DBCA have also been recorded within M70/191, *Tricoryne arenicola* [now *Tricoryne* sp. Wongan Hills (B.H. Smith 794)] (P2), *Cryptandra glabriflora* (P2) and *Regelia megacephala* (P4) (Trudgen 2012). All of these flora are restricted to native vegetation on Eastern Ridge and areas adjacent to West Pit.

The dewatering pipeline will extend from Main and West Pits located on M70/191, and will follow a cleared, disused access track and cleared areas to reach the discharge point at Kyaka Brook Creek. No vegetation will be cleared for the dewatering pipeline or discharge infrastructure at Kyaka Brook Creek located adjacent to M70/1292.

4.4.2 Fauna

Fauna assessments of the Mine and surrounding areas were surveyed by Bamford Consulting Ecologists (2001) and GHD (2019). Bamford Consulting Ecologists focused on areas of remnant vegetation with three sites investigated: Cairn Hill, Western Ridge (which has since been mined) and the Eastern Ridge. GHD surveyed areas north of the existing mine, within tenement M70/1292. Both assessments noted that the remnant vegetation present in the local area supported a varied assemblage of vertebrate species, is of moderate to high value and has an

important role in landscape connectivity. Two conservation significant fauna species are potentially present in the area and are summarized below.

Table 4: Conservation significant fauna

Species	Likelihood
Carnabys Cockatoo (<i>Calyptorhynchus latirostris</i>)	Likely. The species has been recorded in the local area, both flying and foraging. Foraging habitat is present within the Premises.
Peregrine Falcon (<i>Falco peregrinus</i>)	Likely. Species is known from the region, however use would be opportunistic and utilised for foraging purposes only. No breeding habitat present.

4.4.3 Subterranean Fauna

A pilot stygofauna study was conducted in 2005 within the M70/191 to determine whether stygofauna occurred in the groundwater. A total of 17 bores were assessed and four of these yielded stygofauna. Four taxa were identified including two syncarids, an oligochaete worm and a nematode. The syncarids were at the time considered to be of zoological significance (Knott & Goater 2005).

4.4.4 Water sources

The distances to groundwater and water sources are shown in Table 5.

Table 5: Groundwater and water sources

Water sources	Environmental value
Wetlands	<p>No Ramsar listed or Nationally Important wetlands occur within the Premises boundary.</p> <p>The Coonderoo River Wetlands is a historic saline wetland system located approximately 4.5 km northwest of the Mine. The system is made up of a main channel as well as a series of periodic ponds and wetlands. Water chemistry based on two samples taken at the wetlands by actis (2011) indicates that the water is alkaline (pH 7.6 and 8.4) and saline (TDS 30,000 and 68,000 mg/L) (actis 2011).</p>
Surface water	<p>The Mine is located in the Moore River catchment and Coonderoo/ Marchagee sub-catchment. The major drainage lines within the catchment include the Moore River, the Coonderoo River and Gingin Brook (Department of Agriculture 2002). The Coonderoo/Marhagee sub-catchment covers an area of approximately 6500 km² and in the vicinity of the mine site drains from southeast to northwest. Drainage occurs via Pyre Brook Creek (approximately 4 km north of the mine), Kyaka Brook (approximately 500 m north of the mine) and their tributaries into the clay pans and samphire flats of the Coonderoo River (Saprolite 2012).</p> <p>Kyaka Brook extends east and north of the Mine, flowing in a northwest direction where it terminates in the Coonderoo River Wetlands. The Creek has a well-defined course with banks up to a meter deep. Water flows are seasonal and episodic, characterised by fast flowing water and short-lived pools (actis 2011).</p>
Groundwater	The premises occurs within the Jurien Groundwater Area proclaimed under

	<p>the <i>Rights in Water and Irrigation Act 1914 (WA)</i> (RIWI Act).</p> <p>The site lies 3.5 km south of the Coomberdale Water Reserve.</p>
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5. Monitoring

Simcoa will undertake following monitoring, inspection and maintenance activities of the dewatering system during operation:

- Weekly visual inspections of the pipeline, water tank, standpipe and discharge location for leaks and/or evidence of sedimentation when in operation; and
- Groundwater monitoring in accordance with GWL 104693(6) with results presented in the Annual Environmental Report.

Table 6: Operation monitoring schedule

Monitoring location	Parameters	Interval
Production Bores BH1, BH2, In-pit sumps	Cumulative flow meter readings (litres)	Monthly (end of every month)
	Field parameters (pH and EC)	Monthly (end of every month)
	Laboratory parameters <ul style="list-style-type: none"> • Electrical conductivity (EC) • pH • Total dissolved solids (TDS) • Calcium (Ca) • Sodium (Na) • Magnesium (Mg) • Potassium (K) • Sulphate (SO₄) • Chloride (Cl) • Nitrate (NO₃ as NO₃) • Bicarbonate (HCO₃) • Carbonate (CO₃) • Aluminium (Al) • Arsenic (As) • Cadmium (Cd) • Chromium (Cr) • Copper (Cu) • Iron (Fe) • Mercury (Hg) • Manganese (Mn) • Nickel (Ni) • Lead (Pb) • Zinc (Zn) • Silica (SiO₂) • Total Nitrogen (TN) 	Biannually (June and December)

	<ul style="list-style-type: none"> • Total recoverable hydrocarbons (C₆-C₉) • Total recoverable hydrocarbons (C₁₀-C₁₄) • Total recoverable hydrocarbons (C₁₅-C₂₈) • Total recoverable hydrocarbons (C₂₉-C₃₆) 	
Monitoring Bores MB01, MB02, MB03	Water levels (mbgl and m AHD)	Monthly (end of every month)
	EC profiling	Quarterly (March, June, September and December)
Exploration holes M1099, M1735, M1838, M1961	Water levels (mbgl and m AHD)	Quarterly (March, June, September and December)
Discharge location (Kyaka Brook Creek)	Field parameters (pH and EC)	Monthly (when in operation)
	Laboratory parameters <ul style="list-style-type: none"> • Electrical conductivity (EC) • pH • Total dissolved solids (TDS) • Calcium (Ca) • Sodium (Na) • Magnesium (Mg) • Potassium (K) • Sulphate (SO₄) • Chloride (Cl) • Nitrate (NO₃ as NO₃) • Bicarbonate (HCO₃) • Carbonate (CO₃) • Aluminium (Al) • Arsenic (As) • Cadmium (Cd) • Chromium (Cr) • Copper (Cu) • Iron (Fe) • Mercury (Hg) • Manganese (Mn) • Nickel (Ni) • Lead (Pb) • Zinc (Zn) • Silica (SiO₂) • Total Nitrogen (TN) • Total recoverable hydrocarbons (C₆-C₉) • Total recoverable hydrocarbons (C₁₀-C₁₄) • Total recoverable hydrocarbons (C₁₅-C₂₈) 	Biannually (June and December when in operation)

	• Total recoverable hydrocarbons (C ₂₉ -C ₃₆)	
Rain Gauging Station	Rainfall (mm)	Daily

6. Legislative context

6.1 Part IV of the EP Act

The Mine and Smelter were referred to the EPA for assessment in 1987. The Project was assessed at the level of Public Environmental Review and received Ministerial Approval under Part IV in 1988 with the issue of Statement 027. Subsequent to the initial referral, further referrals and assessment of activities have occurred over time for changes at the Smelter or the Mine.

The most recent Ministerial Statement (MS 813) was issued in 2009, with a subsequent amendment in 2016 to correct errors in the Key Characteristics table and remove irrelevant entries. Authorisation was also given to undertake dewatering and discharge via the amendment. The following outlines the authorised extent of physical and operational elements relevant to dewatering activities:

- Discharge of up to 250,000 kL per annum of dewater via Kyaka Brook Creek; and
- Dewater discharge pipeline routed along an existing access road.

6.2 Part V of the EP Act

The Mine is authorised to operate in accordance with L6149/1988/8 for Category 5: Processing or beneficiation of metallic or non-metallic ore. The prescribed premises boundary for the licence includes tenements M70/191, G70/91, G70/92 and G70/93 and does not currently include mine dewatering. 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: Environmental Siting (November 2016)*
- *Guidance Statement: Risk Assessment (February 2017)*
- *Guidance Statement: Decision Making (June 2019)*
- *Guideline: Industry Regulation Guide to Licensing (June 2019)*

6.3 Mining Act 1978

Simcoa currently hold a number of mining, general purpose and exploration leases within the Moora area. In accordance with tenement conditions, proponents are required to submit a Mining Proposal prior to carrying out activities related to mining on an area subject to a mining lease. Prior to the inception of Mining Proposals, Notices of Intent (NOI) were submitted to seek approval for mining related activities. Simcoa has a number of NOI's which authorise mining and related activity. The scope of the NOIs do not specifically authorise dewatering activity however it is implied that dewatering activities are required to reach the final depth of approximately 165 m AHD.

Simcoa met with representatives from the Department of Mining, Industry, Regulation and Safety (DMIRS) on 26 June 2018 to discuss its intention to dewater at the Mine. At this face to face meeting, it was advised that a Mining Proposal (in accordance with 2006 guidelines) would

be required to seek approval to undertake dewatering of the Moora Mine and discharge to Kyaka Brook Creek.

Key findings

DWER understands that a Mining Proposal is currently being prepared by the Applicant for submission to DMIRS.

DMIRS has advised that it has not received a Mining Proposal and Mine Closure Plan under the *Mining Act 1978* for assessment for proposed below water table mining. Prior to commencing the proposed activities, Simcoa Operations Pty Ltd is required to determine the requirement for further approvals under the *Mining Act 1978* via analysis and interpretation of existing approvals documentation. DWER further understands that DMIRS has previously discussed requirements for approvals under the *Mining Act 1978* with the Applicant.

The Delegated Officer notes it is the responsibility of the Applicant to ensure all necessary approvals are obtained under the *Mining Act 1978*.

6.4 Rights in Water and Irrigation Act 1914

Water abstraction is currently undertaken at the Mine to supply water for processing and mining activities. Two abstraction bores are established at the Mine (BH1 and BH2), which are authorised for abstraction in accordance with the requirements of the RIWI Act. Simcoa were granted an increased allocation for their Groundwater licence in 2013 to facilitate dewatering at the Mine in order to access resources below the water table. The resulting amended licence to abstract groundwater (GWL 104693 (6)) for the purposes of dewatering and process/mine water use authorises abstraction of up to 250,000 kL of water per annum from the fractured rock aquifer. The abstraction licence is only applicable to abstraction within mining lease M70/191.

The operation of BH1 will continue as per the licence conditions of GWL 104693 (6). The maximum draw from BH1 will not exceed 80,000 KL per annum and will continue to be used for ore processing and dust suppression purposes when disposed mine water from BH2 is not available.

7. Risk assessment

The identification of the sources, pathways and receptors to determine Risk Events are set out in Table 7 and Table 8 below, consistent with the *Guidance Statement: Risk Assessments*. Risk ratings have been assessed for each key emission source and take into account potential source-pathway-receptor linkages.

The mitigation measures / controls proposed by the Applicant have been considered in determining the risk rating. Emissions during construction and operation have been assessed separately to allow clear delineation of activity phases.

The works approval that accompanies this report authorises construction and time-limited operations. A licence is required to operate the premises following the time-limited operational phase authorised under the works approval.

The conditions in the issued Works Approval, as outlined in Tables 7 and 8, have been determined in accordance with the *Guidance Statement: Setting Conditions*.

7.1 Risk assessment – construction

Table 7: Identification of emissions, pathway and receptors during construction

Risk Event				Likelihood	Consequence	Risk	Reasoning	Regulatory controls
Risk Event - Source/Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
Dewater pipeline construction Construction of tank pad	Dust	Air/windborne pathway causing impacts to health and amenity of closest human receptors located 1200 m east from the premises. Air/windborne pathway causing impacts to vegetation along the pipeline route.	Dust emissions will be managed via existing Part V Licence L6149/1988/8 and standard operating procedures, including: <ul style="list-style-type: none"> Dust suppression (water sprays, water trucks, control of vehicle movements) during construction; Routine maintenance and housekeeping practises to remove waste materials. 	Rare	Minor	Low	The minor construction works are not expected to generate significant dust emissions. Given short timeframe, any dust impact to vegetation is expected to be minimal. Occupational exposure to dust are outside the scope of this assessment. The proposed controls are expected to be sufficient at mitigating dust emissions.	The Delegated Officer considers that section 49 of the EP Act is sufficient to regulate dust emissions during construction.
Construction of Standpipe Construction of discharge point	Noise	Air/windborne pathway causing impacts to health and amenity of closest human receptors located 1200 m east from the premises.	Restricted work hours; construction activities will be conducted in daylight hours. Record, investigate and respond to any noise complaints.	Slight	Minor	Low	The proposed controls are expected to be sufficient at mitigating noise emissions. Occupational exposure to dust are outside the scope of this assessment.	The Delegated Officer considers that the provisions of the Environmental Protection (Noise) Regulations 1997 and General provisions of the EP Act are sufficient to regulate noise emissions during construction.
	Diesel (or other hydrocarbon) Spills	Direct discharge of diesel spills or other hydrocarbons from refueling activities and operation of pumping infrastructure causing soil contamination.	No applicant controls proposed	Possible	Slight	Low	Construction works are short term and relatively small scale.	The Delegated Officer considers that section 49 of the EP Act is sufficient to regulate spills during construction. Condition 9 (clean-up)

7.2 Risk assessment – operation

Table 8: Identification of emissions, pathway and receptors under time-limited operation and during full operation

Risk Event				Likelihood	Consequence	Risk	Reasoning	Regulatory controls
Risk Event - Source/Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
Operation of the dewatering system	Dust	Air/windborne pathway causing impacts to health and amenity of closest human receptors located 1200 m east from the premises. Air/windborne pathway causing impacts to vegetation.	No applicant controls proposed	Rare	Slight	Low	Operational activities are not expected to generate or cause dust emissions.	The Delegated Officer considers that the general provisions of the EP Act are sufficient to regulate dust emissions during operations.
	Vapours	Air/windborne pathway (vapours) causing impacts to health and amenity of closest human receptors located 1200 m east from the premises.	Maintain and operate pumps and generators in accordance with manufacturer's specifications.	Slight	Minor	Low	Operational activities are unlikely to generate or cause vapour emissions requiring applicant controls.	The Delegated Officer considers that the general provisions of the EP Act are sufficient to regulate vapour emissions during operations.

Risk Event				Likelihood	Consequence	Risk	Reasoning	Regulatory controls
Risk Event - Source/Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
	Noise	Air/windborne pathway causing impacts to health and amenity of closest human receptors located 1200 m east from the premises.	Implement noise control measures where required. Maintain and operate pumps and generators in accordance with manufacturer's specifications. Record, investigate and respond to any noise complaints.	Slight	Minor	Low	The proposed controls are expected to be sufficient at mitigating noise emissions.	The Delegated Officer considers that the provisions of the Environmental Protection (Noise) Regulations 1997 and General provisions of the EP Act are sufficient to regulate noise emissions during operation.
		Significant change in behaviour of native animals and birds in the vicinity of the pump	Implement noise control measures where required. Maintain and operate pumps and generators in accordance with manufacturer's specifications.	Slight	Minor	Low	The area of habitat that would be impacted by noise is small and highly disturbed. The applicant's proposed controls are considered sufficient.	The Delegated Officer considers that the provisions of the Environmental Protection (Noise) Regulations 1997 and General provisions of the EP Act are sufficient to regulate noise emissions during operation.
	Dewater	Pipeline / water tank leak causing soil contamination / seepage to groundwater. Direct discharge onto soil and native vegetation, causing topsoil contamination and plant stress or death.	The Pipeline will be bedded with silt fines to prevent damage and movement. Pipeline route along a cleared road. Weekly visual inspection of pipeline / water tank for leaks. Any observed leaks or erosion identified will be dealt with immediately.	Possible	Slight	Low	Emissions to land are unlikely to contribute to adverse impacts to terrestrial systems due to the low frequency of proposed pumping and groundwater quality being fresh to marginal. Discharges are not considered likely to have an impact on groundwater chemistry or quality.	Condition 7 (authorised discharges) Condition 8 (operational requirements) Condition 9 (clean-up) Condition 10 (monitoring)
		Discharge of excess dewater to Kyaka Brook Creek causing sedimentation and groundwater contamination.	The dewater discharge point will be located at Kyaka Brook Creek. Rock pitching will be installed in the Brook to dissipate energy from the discharge and reduce sedimentation. Water will be pumped to the storage tank for onsite and offsite reuse prior to being diverted to Kyaka Brook Creek, allowing for sediments to settle out and minimizing the total volume discharged to the environment. Monitoring undertaken as per Section 5.	Possible	Minor	Medium	Emissions to land are unlikely to contribute to adverse impacts to terrestrial systems due to: <ul style="list-style-type: none"> A low expected frequency of proposed pumping and groundwater quality being fresh to marginal. Discharges are not considered likely to have an impact on groundwater chemistry or quality. The Creek has a well-defined course with banks up to a meter deep. Water flows in the creek are seasonal and episodic, characterised by fast flowing water and short-lived pools. The distance to sensitive receptors (Coonderoo River Wetlands located 4.5 km from the discharge location). 	Condition 7 (authorised discharges) Condition 8 (operational requirements) Condition 9 (clean-up) Condition 10 (monitoring)

Risk Event				Likelihood	Consequence	Risk	Reasoning	Regulatory controls
Risk Event - Source/Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
		Discharge of excess dewater to the Kyaka Brook Creek impacting priority flora species and vegetation associations	Dewater will be pumped to the storage tank for onsite and offsite reuse prior to being diverted to Kyaka Brook Creek, minimizing the total volume discharged to the environment. Monitoring undertaken as per Section 5.	Possible	Minor	Medium	Emissions to land are unlikely to contribute to adverse impacts to terrestrial systems due to the low frequency of proposed pumping and dewater quality being fresh to marginal. Discharges are not considered likely to have an impact on groundwater chemistry or quality.	The Delegated Officer considers that section 49 of the EP Act is sufficient to regulate noise emissions during construction. Condition 7 (authorised discharges) Condition 8 (operational requirements) Condition 9 (clean-up) Condition 10 (monitoring)
		Discharge of excess dewater to the Kyaka Brook Creek impacting subterranean fauna.	Dewater will be pumped to the storage tank for onsite and offsite reuse prior to being diverted to Kyaka Brook Creek, minimizing the total volume discharged to the environment. Monitoring undertaken as per Section 5.	Unlikely	Minor	Medium	Emissions to land are unlikely to contribute to adverse impacts to subterranean fauna due to: <ul style="list-style-type: none"> A low expected frequency of proposed pumping. Surficial aquifer ranges from saturated to unsaturated across the Moora region with a confined or semi confined aquifer beneath. Discharges are not considered likely to have an impact on groundwater chemistry or quality. 	Condition 8 (operational requirements) Condition 10 (monitoring)
		Discharge of excess dewater to the Kyaka Brook Creek causing mounding of the groundwater into the root zone of surrounding native vegetation, causing stress or death.	Dewater will be pumped to the storage tank for onsite and offsite reuse prior to being diverted to Kyaka Brook Creek, minimizing the total volume discharged to the environment. Monitoring undertaken as per Section 5.	Unlikely	Minor	Medium	The standing water level of the surficial aquifer in the vicinity of the Premises is between 11 metres and 22 metres below ground level. Potential mounding is considered unlikely to impacts the root zone of vegetation. Local vegetation species are considered to be water logging tolerant.	Condition 8 (operational requirements) Condition 10 (monitoring)
	Hydrocarbon spills	Direct discharge of diesel spills from refueling activities and operation of pumping infrastructure causing soil and/or groundwater contamination.	No applicant controls proposed	Possible	Slight	Low	Potential for small scale hydrocarbon spills.	Condition 9 (clean-up)

8. Consultation

Method	Comments received	DWER response
Application advertised on DWER website and in the West Australian newspaper (20/05/2020)	None received	N/A
DMIRS advised of proposal (22/05/2020)	DMIRS has not recently received a Mining Proposal and Mine Closure Plan under the <i>Mining Act 1978</i> for assessment for proposed below water table mining. Prior to commencing the proposed activities Simcoa Operations Pty Ltd is required to determine the requirement for further approval under the <i>Mining Act 1978</i> via analysis and interpretation of existing approvals documentation. DMIRS has previously discussed requirements for approvals under the <i>Mining Act 1978</i> with Simcoa Operations Pty Ltd, further consultation is recommended.	Prior to works commencing Simcoa Operations Pty Ltd will be required to gain all necessary mining approvals.
Local Government Authority (Shire of Moora) advised of proposal (22/05/2020)	No comments received	N/A
Applicant referred draft documents (14/07/2020)	Comments received 4/08/2020	Comments considered in issuing final instrument and decision report.

9. 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.

Melissa Chamberlain
A/MANAGER WASTE INDUSTRIES
REGULATORY SERVICES

An officer delegated by the CEO under section 20 of the EP Act

Appendix 1: Key documents

Document title	Availability
Actis Environmental Services (actis) 2011, Proposed Discharge Evaluation: Coonderoo River Wetlands, unpublished report prepared for Simcoa Operations Pty Ltd.	Unpublished report
DER, July 2015. Guidance Statement: Regulatory principles. Department of Environment Regulation, Perth.	accessed at www.dwer.wa.gov.au
DER, October 2015. <i>Guidance Statement: Setting conditions</i> . Department of Environment Regulation, Perth.	
DER, February 2017. <i>Guidance Statement: Risk Assessments</i> . Department of Environment Regulation, Perth.	
DWER, June 2019. <i>Guideline: Decision Making</i> . Department of Water and Environmental Regulation	
DWER, June 2019. <i>Guideline: Industry Regulation Guide to Licensing</i> . Department of Water and Environmental Regulation	
Department of Water (DoW) 2009, Jurien Groundwater Area Subarea Reference Sheets, Department of Water, Government of Western Australia, Perth.	Accessed via internet search
GHD, March 2020. Moora Quartzite Works Approval Supporting Report (March, 2020)	DWER records (A1898270)
Knott, B and Goater, S 2005, Moora Quartzite Mine, stygofauna pilot survey, unpublished report prepared for Simcoa Operations Pty Ltd.	Unpublished report
ME Trudgen and Associates 2012, An extension of a flora survey, floristic analysis and vegetation survey of areas of the Coomberdale Chert TEC to include a further area, unpublished report prepared for Simcoa Operations Pty Ltd.	Unpublished report
ME Trudgen and Associates 2018, Comparison of the flora and vegetation of the proposed North Kiaka Mine Area to other parts of the Coomberdale Chert Threatened Ecological Community, unpublished report prepared for Simcoa Operations Pty Ltd.	Unpublished report
Mine Earth 2018, Moora Quartzite Mining Operations, Mine Closure Plan 2018, unpublished report prepared for Simcoa Operations Pty Ltd.	Unpublished report
Moore River Catchment 2018, Native Revegetation Guide for the Moore River Catchment.	Accessed via internet search

Saprolite 2012a, Moora Quartzite Mine – Phase 2 Hydrogeological Investigations, unpublished report prepared for Simcoa Operations Pty Ltd.	Unpublished report
Simcoa Operations Pty Ltd Moora Quartzite Works Approval application (18 December, 2019)	DWER records (DWERDT269581)