



Application to amend works approval

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

Works approval number	W6158/2018/1
Works approval holder	Hastings Technology Metals Limited
ACN	122 911 399
File Number:	DER2018/000838
Premises	Yangibana Rare Earths Project Early Works Mining Leases M09/158, M09/157, L09/68, L09/70, L09/80, L09/81, G09/14, and E09/1700 WEST LYONS RIVER WA 6705
Date of report	6 April 2020
Decision	Works Approval amended

1. Definitions

Key terms relevant to this decision report and their associated definitions are listed in Table 1.

Table 1: Definitions

Term	Definition
Applicant	Hastings Technology Metals Limited
Category / categories	Categories of prescribed premises as set out in Schedule 1 of the EP Regulations.
Decision Report	refers to this document.
Delegated Officer	An officer delegated under section 20 of the EP Act.
Department	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.
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.
Emission	has the same meaning given to that term under the EP Act.
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
Noise Regulations	<i>Environmental Protection (Noise) Regulations 1997 (WA)</i>
Occupier	has the same meaning given to that term under the EP Act.
Prescribed premises	This 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
Risk Event	As described in <i>Guidance Statement: Risk Assessment</i>
Works Approval Holder	Hastings Technology Metals Limited

2. Amendment Description

2.1 Description of proposed activity

Hastings Technology Metals Limited (Hastings) has applied for an amendment to Works Approval W6158/2018/1. The existing works approval has approval for a Category 12 Screening etc. of material, Category 64 Class II putrescible landfill and Category 85 sewage facility. This application is to amend the assigned production or design capacity of the Category 85 sewage facility from 70m³/day to 98.8m³/day to accommodate 380 people (260L per day) as part of Stage 2 of the project.

Table 2 below outlines the proposed changes to the Works Approval.

Table 2: Proposed design or throughput capacity changes

Category	Current capacity	throughput	Proposed capacity	throughput	Description of proposed amendment
85	70m ³ /day		98.8m ³ /day		Increase of wastewater treatment plant throughput

The infrastructure and equipment are outlined in the Table 3 and the site layout is shown in Figure 1.

Table 3: Infrastructure and equipment

Infrastructure or Equipment	Site Layout Plan reference (Figure 1)
Bardenpho wastewater treatment plant comprising: •3 x aerator tanks •Pump station •2 x 32kL balance tanks •Anaerobic tank •Anoxic tank •2 x clarifier tanks •Chlorine contact tank •2 x 32kL irrigation tanks •10kL sludge tank •Associated HDPE pipelines.	3
Increased irrigation field from 1ha to 4 ha	2

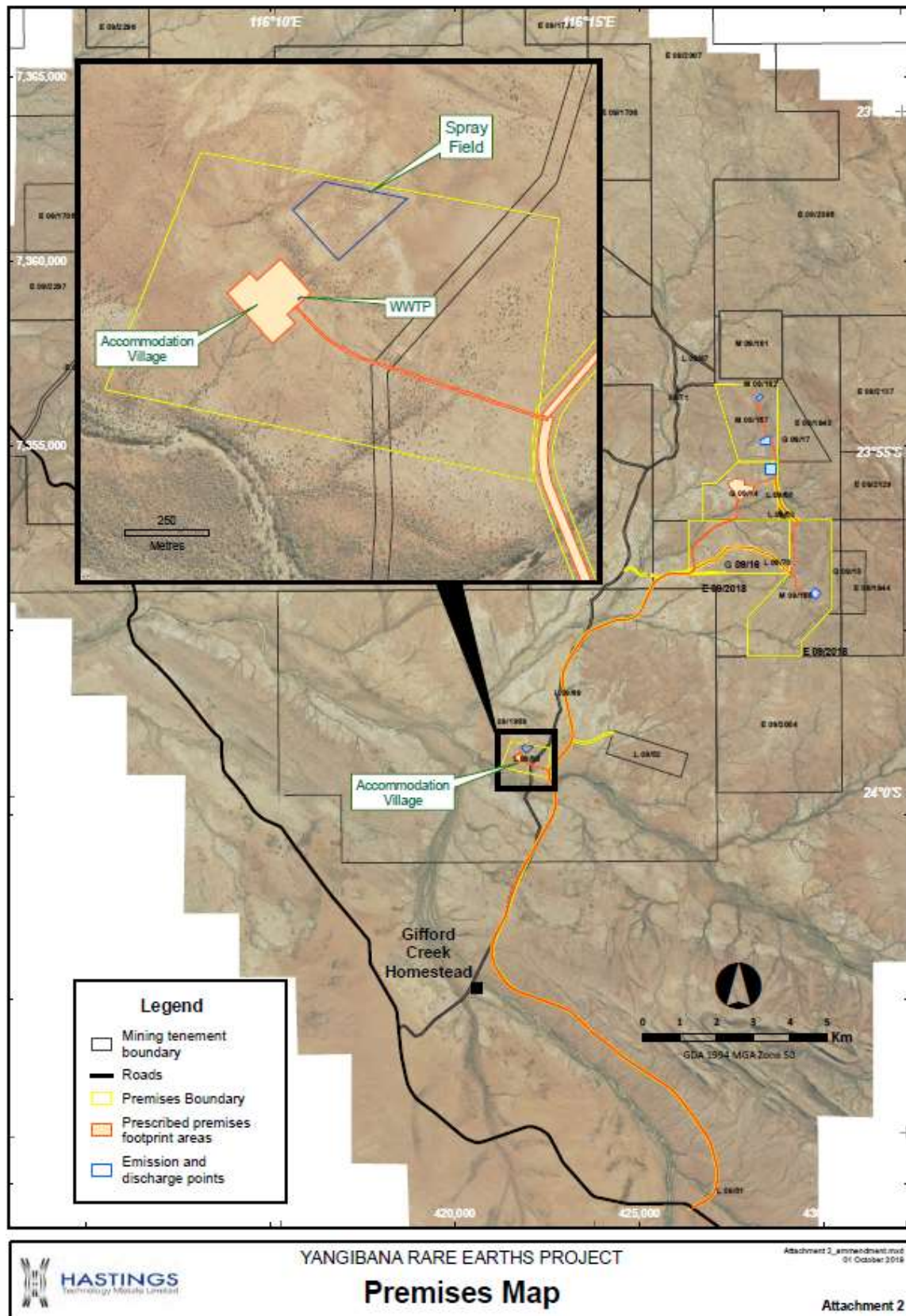


Figure 1: Site Layout Plan

The sewage facility process comprises (refer Figure 1):

- Waste collection (pump station) – raw sewage is gravity fed from its source and pumped to the balance tank;
- Screening (Spirac screen) – from the pump station, raw influent passes through a Spirac inlet screen which removes inorganic waste, which is subsequently dewatering and disposed of into a bin automatically. Screened influent is gravity fed to the balance tank;
- Mass holding (22kL and 32 kL Balance tank) – designed to handle peak flows from the sewage pump inputs over a 12 hour period, provide a controlled flow twice daily into Primary tank one;
- Anaerobic treatment (Primary tank 1) – holding/mixing tank to introduce sludge drawn from the clarifier to the influent which acts to introduce bacteria to the influent and return the converted nitrates to the anoxic zone to be further converted to nitrogen gas. The mixed influent flows to the Primary tank 2 using a trickle through system to allow the top surface of the water to overflow to the Primary tank 2;
- Anoxic treatment (Primary tank 2) – denitrification occurs, whereby oxidised nitrogen in solution is converted to nitrogen gas. Trickle through system allows wastewater to flow through to the aeration tank;
- Aeration (Aeration tank) – oxygen is provided via a mixing aerator which is controlled via on/off timers set to maintain the dissolved oxygen levels of between 1-2 mg/L. This allows for oxidation of nutrients, reducing ammonia, Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD). Wastewater then flows to the clarifier;
- Clarification (Clarifier tank) – suspended activated sludge is settled out. As influent enters the clarifier is it dosed and mixed with poly aluminium chloride which binds particles together. The treated effluent passes through to the chlorine contact tank. Settled sludge is removed with a pump and returned to primary tank 1 to mix with new incoming raw sewerage. Waste sludge is pumped into the sludge thickening tank;
- Chlorination (Chlorine contact tank) – chlorine is added (tablet form) to reach and maintain a chlorine residue of around 2 mg/L. Water is retained so a 30 minute contact time is achieved before entering the final irrigation tank;
- Irrigation (22 kL and 32kL irrigation tank) – treated wastewater (Category C as referenced in National Water Quality Management Strategy, Australian Guidelines for Sewerage Systems, Effluent Management 1997 (NWQMS, 1997)) and waste water from the Reverse Osmosis Plant will be directed to the irrigation tank, from where it will be disposed of via irrigation to a designated spray field; and
- Sludge thickening (9.5 kL sludge thickening tank) – excess sludge is thickened for removal via a waste disposal truck.

Effluent will be treated to a secondary level of treatment (Category C) in accordance with the NWQMS, 1997 with effluent achieving the specifications detailed in Table 4.

Table 4: 100kL/day Sewage plant performance specifications

Parameter	Units	Value
Daily flow	m ³ /day	100
pH	pH units	6.8-8.5
Biochemical Oxygen Demand	mg/L	<20

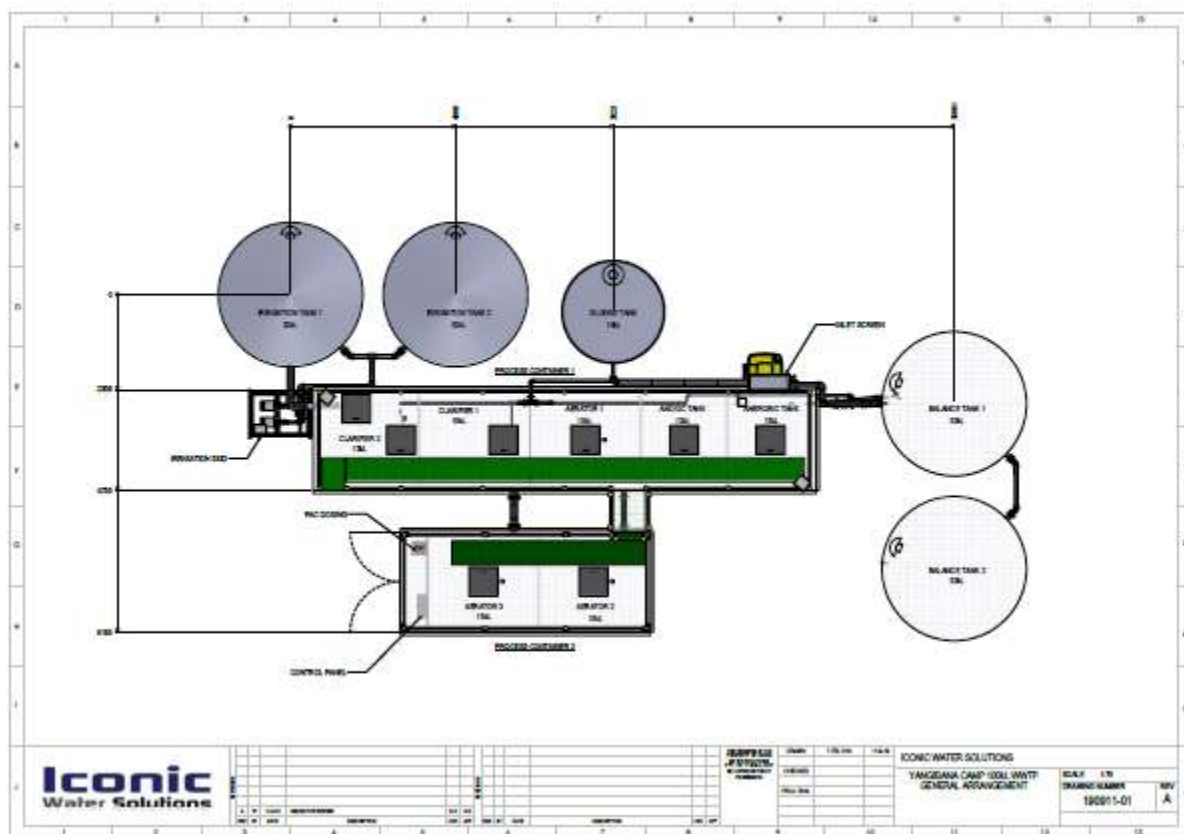


Figure 3: Updated wastewater treatment plant

Commissioning activities

The following commissioning actions will be undertaken for the WWTP:

1. Mechanical and electrical checks over a period of approximately three (3) days;
2. Dry commissioning of the system using clean water; checking no hydrocarbon leaks at pumps and power supply, no leaks from the treatment system and sprinklers are operational and no flooding within spray field;
3. Loading of chlorine and bacteria into the appropriate tanks, commencement of wet commissioning using site effluent over a three-month period. During wet commissioning:
 - water samples will be collected approximately every two (2) weeks, laboratory analysis and verification of measurements within specified limits;
 - checks for odour will be undertaken;
 - checks for effluent and hydrocarbon leaks undertaken; and
 - checks for effectiveness of spray field.

3. Legislative context and other approvals

The legislative framework for this assessment is the *Environmental Protection Act 1986* (EP Act) and *Environmental Protection Regulations 1987* (EP Regulations).

Approvals relevant to the premises are outlined in

Table 5.

Table 5: Relevant approvals and tenure

Legislation	Number	Approval
<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i> (EPBC Act)	Decision Notice EPBC 2016/7845	The preliminary/minor works of this occur as a component of a larger Project currently assessed as a 'controlled action' under the EPBC Act. Two approvals under section 156 of the EPBC Act has been granted for the minor or preliminary works.
<i>Rights in Water and Irrigation Act 1914</i>	PMB201193(1)	Bed and Banks Permit to construct the access road across the Lyons River and other drainage channels.
	GWL183285(2)	Licence to take water for dust suppression for earthworks and construction purposes, exploratory drilling, mining camp purposes.
<i>Mining Act 1978</i>	Registration ID 72489	Approval for Mining Proposal with a Mine Closure Plan for the Yangibana Rare Earths Project
<i>Radiation Safety Act 1975</i> <i>Mines Safety and Inspection Act 1994</i>	RM-992-310716	Exploration Radiation Management Plan, identification, assessment, control and reporting of radiation hazards and risks
<i>Part IV of the EP Act (WA) - Section 41A(3)</i> Notice of decision to consent to minor or preliminary works issued 25 August 2017 and 23 March 2018.	Assessment No. 2115	Construction and operation of an access road, accommodation facilities, wastewater treatment plant and irrigation field in order to undertake investigative works including water investigations, geotechnical assessments, environmental surveys and mineral exploration activities. Including approval to clear vegetation at landfill, WWTP, irrigation field and borrow pit locations.
<i>Part IV of the EP Act – Statement that a Proposal may be implemented, Yangibana Rare Earths Project, Published 19 August 2019</i>	Statement No. 1110	This proposal is to develop a mine to extract and process rare earth elements. The proposal includes five open pits, tailings facilities and ancillary infrastructure to support the mining operations.

4. Emission sources, pathways, receptors and controls

4.1 Emissions

The potential for emissions to impact on sensitive receptors has been assessed in accordance with the Department's Risk Framework. The key emissions considered in this report are dust, noise from construction of wastewater treatment plant activities including equipment placement and use and vehicle movements. Emissions during operations include odour, sewage discharge from rupture of pipes or overtopping of holding tanks and treated effluent to land through irrigation. The applicant has proposed measures to assist in controlling these emissions, where necessary. The control measures have been considered when undertaking the risk assessment detailed in Section 5.

4.2 Pathways

Surface / overland runoff has been considered a pathway for effluent discharge to land and surface waters from rupture of pipes or overtopping of holding tanks. Direct discharge to land

from treated effluent is a pathway for irrigation of treated wastewater to land.

Infiltration through soil to groundwater has also been considered as a pathway for effluent discharge to groundwater.

These pathways have been considered in the risk assessment table in Section 5.

4.3 Receptors

Risk is assessed as a combination of emission sources, the proximity and sensitivity of receptors to those emission sources and any pathways that can allow the emission to reach and potentially harm the receptor and Table 6 provides a summary of human and environmental receptors in proximity to the premises which have a potential to be impacted from site activities, and the risk assessment in Section 5 considers these receptors in the context of emissions and potential pathways.

Table 6: Receptors and distance from activity boundary

Human receptors	Distance from activity or prescribed premises
Gifford Creek Homestead	Approximately 6.5 km south-southwest of the WWTP and irrigation area, 12 km south-southwest of the landfill and 15 km south-southwest of the nearest borrow pit area. The Delegated Officer considers it unlikely a Risk Event for dust or noise emissions will occur given the minimum distance of 6.5 km between the prescribed activity and this receptor. As such, the Delegated Officer does not consider the risk to be significant enough to warrant further assessment and therefore this receptor has not been considered in the Risk Assessment in Section 5 below.
Environmental receptors	Distance from activity / prescribed premises
Priority Ecological Community (PEC), Priority 1 (P1) Gifford Creek, Mangaroon, Wanna calcrete groundwater assemblage type on Lyons palaeodrainage on Gifford Creek, Lyons and Wanna Stations (Gifford Creek Calcrete PEC). This PEC comprises unique assemblages of invertebrates (stygo fauna) that have been identified in the network of groundwater calcretes. Stygo fauna occur within both the fractured rock aquifers across the broader Project area (mining tenements) as well as the calcrete aquifers within the PEC footprint.	The Project development envelope intersects the northern portion of this PEC, however the prescribed premises will not intersect the shallow calcrete aquifer and there will be no excavation below the groundwater table. The nearest calcrete is approximately 2 km from the nearest borrow pit, 650 m from the WWTP and 525 m from the irrigation area.
A Level 2 Flora and Vegetation assessment of the Yangibana Study Area (55,000 ha), including the borrow pit and accommodation village locations was undertaken. No threatened flora listed under the EPBC Act and Wildlife Conservation Act 1950 (WA) were recorded. Six Priority Flora listed by the DBCA were recorded in the development envelope of the	Six priority species were recorded within the development envelope, however these are not located within the proposed disturbance footprint of the prescribed activities.

proposed minor or preliminary works, being: • <i>Acacia curryana</i> (Priority 1); • <i>Rhodanthe frenchii</i> (Priority 2); • <i>Wurmbea fluvialis</i> (Priority 2); • <i>Spolobolus blakei</i> (Priority 3); • <i>Goodenia Berringbinensis</i> (Priority 4); and <i>Goodenia nuda</i> (Priority 4).	
Fauna species of conservation significance recorded in the study area, being: • <i>Sminthopsis longicaudata</i> (Long-tailed Dunnart), listed as Priority 4 species by the Department of Biodiversity, Conservation and Attractions (DBCA); • <i>Pseudomys chapmani</i> (Western Pebble-mound Mouse, listed as Priority 4 species by DBCA); • <i>Falco hypoleuca</i> (Grey Falcon), listed as a Schedule 3 species under the <i>Wildlife Conservation Act 1950</i> (WA)	Mouse mound identified 15 km south of prescribed premises. Grey Falcon recorded 20 km south of the closest borrow pit location. The Delegated Officer considers it unlikely a Risk Event for impacts to fauna will occur given the minimum distance of 15 km between the prescribed activity and this receptor. As such, the Delegated Officer does not consider the risks to be significant enough to warrant further assessment and therefore this receptor has not been considered in the Risk Assessment in Section 5 below.

Table 7: Groundwater and water sources

Groundwater and water sources	Distance from Premises	Environmental value
Lyons River, including two semi-permanent pools Gifford Creek	Lyons River is approximately 600m south of the WWTP and irrigation area. Two semi-permanent pools in the Lyons River occur within 5km of the proposed preliminary or minor works.	Ephemeral river, only flowing after rainfall events. Riparian vegetation, ephemeral pools with associated groundwater dependant ecosystems and the network of shallow calcrete aquifers associated with the Gifford Creek PEC.
Groundwater	Located within the Gascoyne Groundwater Proclamation Area. Depth to groundwater approximately 10 m below ground level (bgl) in creeks and Lyons River, groundwater measured at 33 m (bgl) at an early works bore installed adjacent to borrow pit. Depth to groundwater at the nearest pastoral bore (approximately 1-2km from the Premises) to the irrigation area is approximately 25 mbgl	Information submitted by the applicant states that total dissolved solids (TDS) in groundwater salinity within the Project area ranges from 600 to 2,800 mg/L which is considered as being marginal to saline, pH ranges from neutral to slightly alkaline. Pastoral bores used for livestock watering. Abstracted groundwater will be treated and utilised as the

		Projects water supply.
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4.4 Applicant controls

The applicant has proposed the following management measures/controls as part of the application:

Emission (as identified above)	Source	Proposed controls
Dust	Vehicle movements on unsealed access roads. Earthworks, construction of new plant and infrastructure.	No controls proposed.
Noise	Vehicle movements. Earthworks, construction of new plant and infrastructure.	No controls proposed.
Discharge of sewage	Rupture of wastewater treatment pipes and / or storage tank failure	Daily and weekly inspections of the WWTP infrastructure and tank levels and irrigation field equipment. Alarms within systems when levels are exceed set limits or failure of equipment occurs. Earthen bunding constructed around facility to protect from flood waters and contain leaks and spills. HDPE pipelines will convey wastewater, treated wastewater and reverse osmosis reject water.
Discharge of treated effluent	Irrigation of treated effluent to land	Daily and weekly inspections of the WWTP infrastructure and tank levels and irrigation field equipment to ensure effective operations of WWTP.

5. Risk assessment

The identification of the sources, pathways and receptors to determine Risk Events are set out in the table 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, have been determined in accordance with the *Guidance Statement: Setting Conditions*.

5.2 Risk assessment – operation (information only)*

Risk Event				Consequence rating**	Likelihood rating**	Risk**	Reasoning	Regulatory controls (refer to conditions of the granted instrument)
Source/ Activities*	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
Sewage pipes and holding tanks	Sewage discharge from the rupture of pipes or overtopping of holding tanks.	Direct discharge to land, surface water, soils and vegetation adjacent to pipes and holding tanks causing vegetation distress or death and surface water contamination.	See section 4.4	Minor	Unlikely	Medium	Applicant proposed controls are sufficient in managing the potential risks.	Construction and Design requirement conditions on the existing works approval include: • WWTP fitted with high level alarms as well as malfunction alarm. • Earthen bunding constructed around perimeter of WWTP • Contingency overflow to three pump pits for storage of waste water
Irrigation of treated effluent	Treated effluent to land	Direct discharge of treated effluent with elevated nutrient and heavy metals to vegetation causing adverse impacts to the health and survival of vegetation in the irrigation area.	See section 4.4	Minor	Unlikely	Medium	Given the distance to groundwater, applicant controls the Delegated Officer considers the risk to be medium.	WWTP will be designed and constructed to meet the following emission standards: BOD <20mg/L TSS <30mg/L TDS RO plant reject water – 800mg/L TDS WWTP treated effluent – 1,000 mg/L TN <30mg/L TP <8mg/L pH 6.8 – 8.5 E.coli <1000 coliform forming units / 100mL (cfu / 100mL) The irrigation field: Stage 2 – expanded to 4 ha to receive up to 100m³/day of treated wastewater and up to 50m³/day of reject water from the reverse osmosis plant.

*The works approval that accompanies this Report authorises construction only. A licence is required for operations.

**Consequence ratings, likelihood ratings and risk descriptions are detailed in the Department's Guidance Statement: Risk Assessments (February 2017)

6. Consultation

Method	Comments received	DWER response
Applicant referred draft documents (24 March 2020)	Clarification provided on the wastewater treatment infrastructure to be installed.	Table 2 of the Works Approval has been updated with the correct infrastructure.

7. Conclusion

Based on the assessment in this decision report, the Delegated Officer has determined that the application to amend works approval W6158/2018/1 will be granted, subject to the conditions identified below:

Table 1 provides a summary of the proposed amendments and will act as record of the implemented changes. All proposed changes have been incorporated into the Revised Works Approval as part of the amendment process.

Table 8: Works Approval amendments

Condition No.	Proposed amendments
1	<i>Inclusion of new infrastructure that will be installed to treat the additional wastewater and increased irrigation field.</i>

These conditions reflect the controls determined to be and necessary for emissions management, administration and reporting requirements.

Lauren Fox
A/MANAGER RESOURCE INDUSTRIES
INDUSTRY REGULATION

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

Appendix 1: Key documents

Document title	Availability
Works Approval (W6158/2018/1) application form and supporting documentation (Month, Year)	DWER records (DWERDE226038)
Supplementary information for works approval application (18/02/2020)	DWER records (A1869489)
DER, July 2015. <i>Guidance Statement: Regulatory principles</i> . 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, August 2016. <i>Guidance Statement: Licence duration</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	