Government of Western Australia
Department of Water and Environmental Regulation

Decision Report

Application for Works Approval

Division 3, Part V *Environmental Protection Act 1986*

Works Approval Number	W6358/2020/1
Applicant	Australian Aboriginal Mining Corporation
ACN	76 126 497 434
File Number	DER2019/000649
Premises	First Iron Project Tenement M47/1424 As defined by the coordinates in Schedule 2 of the Works Approval
Date of Report	24 July 2020
Status of Report	Final

Table of Contents

1. Definitions of terms and acronyms

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

Table 1: Definitions

Term	Definition
AACR	Annual Audit Compliance Report
AAMC	Australian Aboriginal Mining Corporation
ACN	Australian Company Number
Category/ Categories/ Cat.	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
Cfu	Colony forming unit
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.
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 *Public Sector Management Act 1994* and is responsible for the administration of the *Environmental Protection Act 1986* along with other legislation.
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
GIS	Geographic Information System
Minister	the Minister responsible for the EP Act and associated regulations
mbgl	Metres below ground level
mtpa	million tonnes per annum
Occupier	has the same meaning given to that term under the EP Act.
OHP	Ore Handling Plant
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
Risk Event	As described in *Guidance Statement: Risk Assessment*
WWTP	Wastewater treatment plant

2. Project location and background

The First Iron Project (the Project) will involve the extraction of high-grade iron ore from three deposits. Australian Aboriginal Mining Corporation (AAMC) is proposing to develop the Project in parallel with an agreement with Fortescue Metals Group Ltd (FMG) for a mine gate ore sale - the ore will be hauled by road to FMG's Cloudbreak mine. The ore will then be exported by FMG from Port Hedland Port.

The Project development envelope is located within tenements M47/1423, M47/1424 and M471425, within the Shire of East Pilbara, Western Australia. The nearest town is Newman located approximately 74kms south-east of the premises boundary. Karijini National Park is located approximately 45kms to the west. Figure 1 below illustrates the project location.

AAMC has acquired Wonmunna Iron Ore Pty Ltd, owner of the First Iron Project (the Project). The Project was previously known as the Wonmunna Iron Ore (WIO) Project. The project has not been commenced by AAMC or the previous proponent (Ascot Resources Ltd).

3. Purpose and scope of assessment

On 2 December 2019 AAMC applied for a works approval for the Project under Part V, Division 3 of the *Environmental Protection Act 1986*.

The works approval application relates to prescribed premises to be located within tenement M47/1424. The works approval application is for the following activities:

- Construction and commissioning of an Ore Handling Plant (OHP); and
- Construction and commissioning of a wastewater treatment plant (WWTP).

The relevant prescribed premises categories and the associated design capacities are detailed in Table 2.

Table 2: Prescribed Premises Categories

Prescribed premises category	Proposed production/design capacity
Category 5 Processing or beneficiation of metallic or non-metallic ore: premises on which – Metallic or non-metallic ore is crushed, ground, milled or otherwise processed.	5 million tonnes per annum
Category 85 Sewage facility: premises - (a) on which sewage is treated (excluding septic tanks); or (b) from which treated sewage is discharged onto land or into waters	30m^3 per day

Figure 2 illustrates the premises boundary (within tenement M47/1424) and the location of the OHP and WWTP.

The estimated operating period for the premises is 11 years.

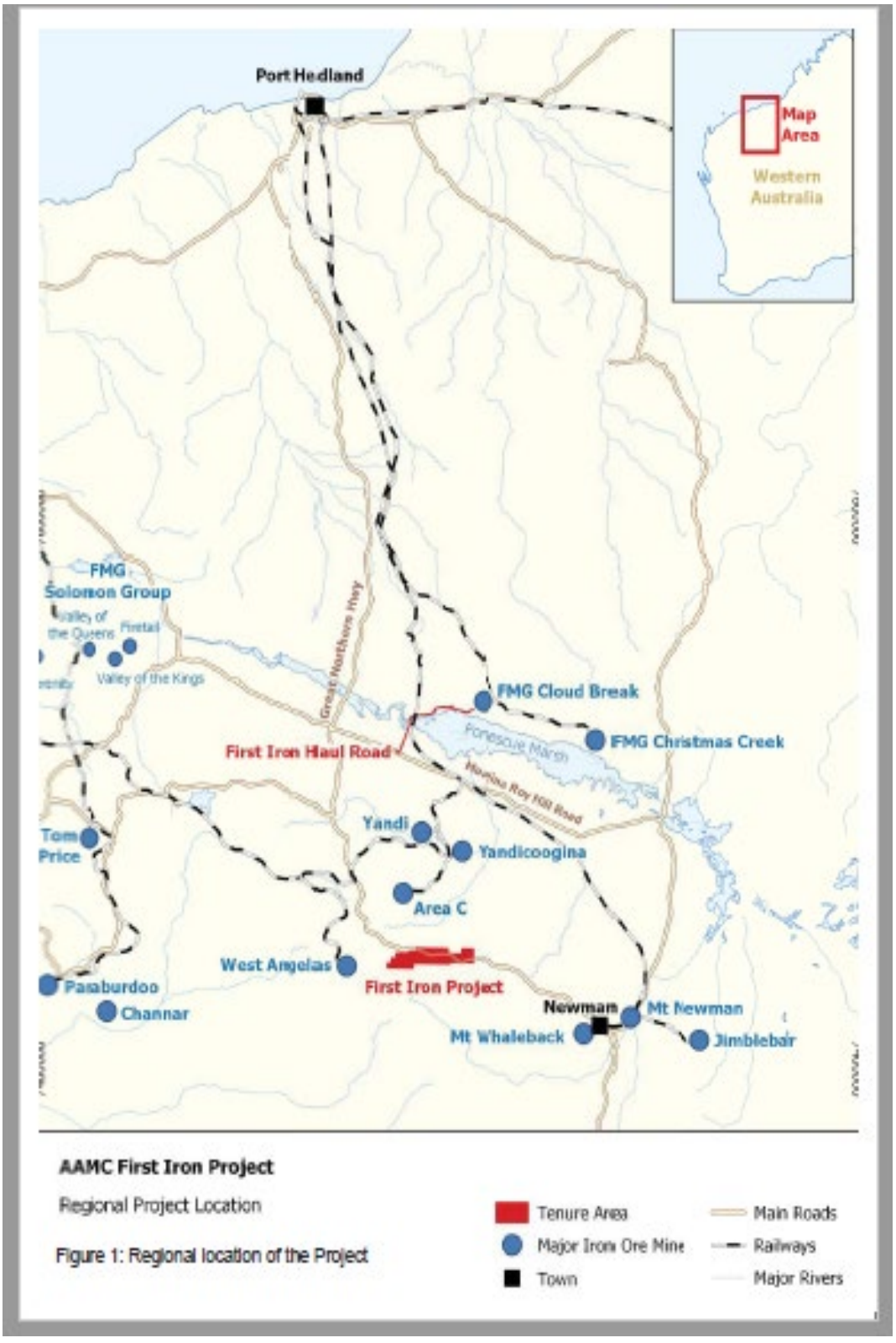

Figure 1: Regional location of the First Iron Project

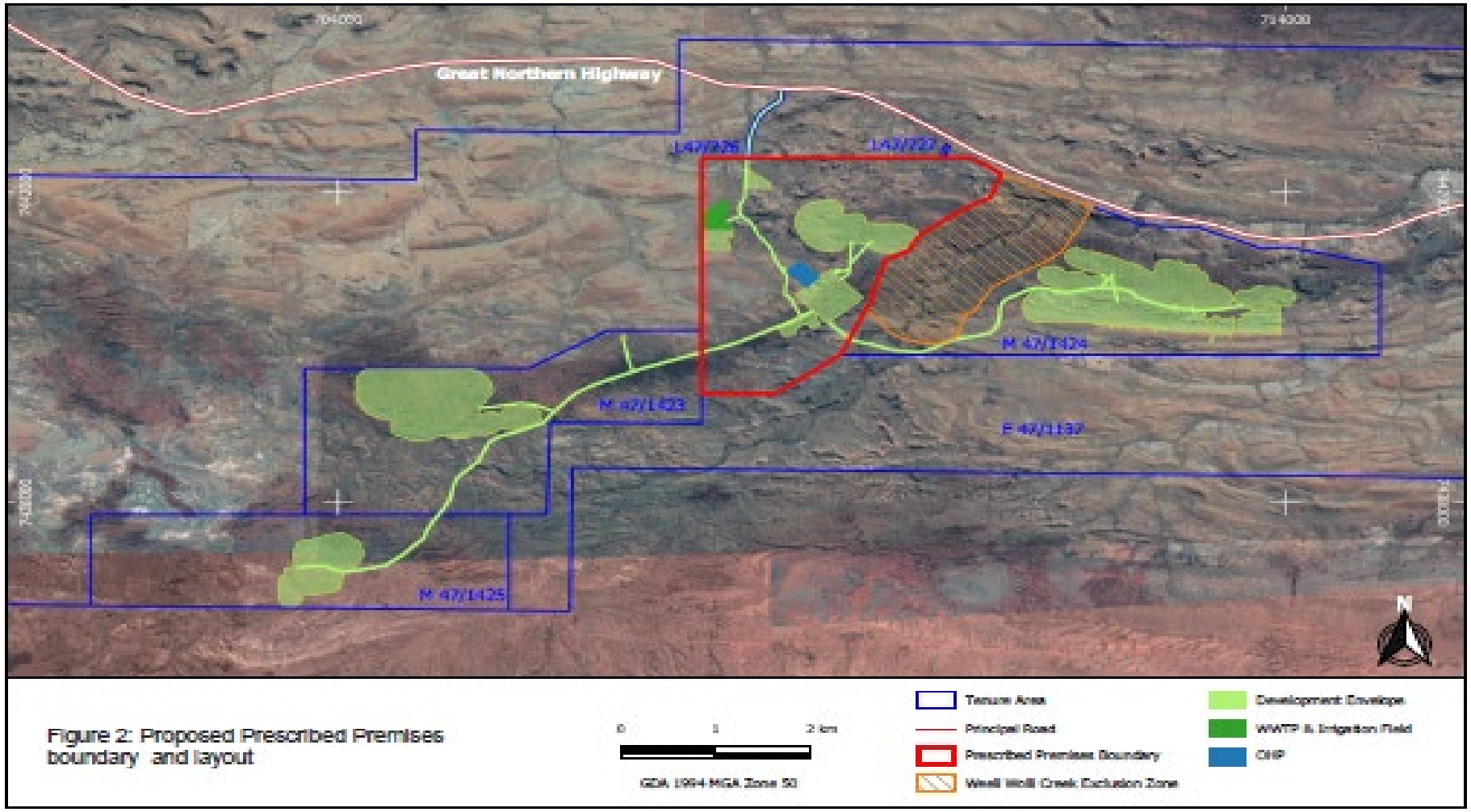

Figure 2: Prescribed premises boundary and location of the OHP and WWTP

4. Overview of Premises

4.1 Infrastructure design and operation

4.1.1 Ore handling plant

Ore mined from the Project deposits will be delivered and stockpiled on a ROM Pad until loaded into a hopper for processing. Ore will then be crushed and screened at the OHP to a minus 11 mm product size. The OHP will operate 24 hours per day, 7 days per week and will process up to 5 Mtpa over the 11-year Life of Mine.

OHP Design

The OHP will be sourced second hand for the Project. AAMC has identified a suitable plant at the Galaxy Resources crushing and screening circuit in Ravensthorpe. Additional available components (Double Deck Vibrating Screen and Cone Crusher) have also been identified from other mining operations that will be added to the Galaxy plant to reach the required screening capacity for the Project. Further feasibility assessments for the Project may identify alternative components for the OHP, however the Galaxy Resources crushing and screening circuit design forms the basis of the works approval application.

Figure 3 and Figure 4 illustrate the OHP general arrangement.

OHP Construction

The OHP will arrive on site as separate components which will be assembled at the Project ROM pad. The OHP will require a 5.0 m pad to be built with overburden from pre-stripping of the nearby north-west pit.

OHP Operation

A vibrating grizzly feeder will discharge material from the ROM Bin to the primary crusher. Both grizzly screen underflow and jaw crusher product will report to a common discharge conveyor that feeds the screen feed conveyor.

The primary screen will be a double deck banana screen configured to produce a final product from the bottom deck underflow. The bottom deck media will be protected by the use of a heavy-duty top deck media system. Top deck oversize material is to be directed to the secondary crushing station in a closed circuit with the primary screen. A bin and belt feeder arrangement then directs ore to the secondary crusher.

The primary screen middlings product will be directed to the tertiary crushing station. This crusher is also operating in closed circuit with the primary screen. A bin and feeder will direct ore to the tertiary crusher.

Fines product from the screen will be stockpiled using a conventional 37m radial stacker with a stockpile capacity of 15,000 m^3.

Figure 5 illustrates the process flow through the OHP

Stockpiled ore will be loaded onto trucks for road transport to FMG's Cloudbreak Mine.

The OHP design includes components to manage dust emissions including:

- Sprinklers on crushers and screens; and
- Shields/covers on conveyors and transfer points.

Water trucks will be used to manage dust emissions at the ore stockpile area, hardstand areas and bare areas.

OHP commissioning

Commissioning of the OHP will be completed through four stages as outlined below.

Pre-Commissioning / Construction Verification

The first phase of pre-commissioning occurs in conjunction with the construction activities and aims to ensure that each system and area is complete as per the designer's and manufacturer's intentions. All QA/QC documentation will be required to be assessed by the commissioning team. Point to point testing will be commenced during this phase.

Energisation

During the energisation phase, power will be "released" in a controlled manner. Initially, control voltage and light and small power circuits will be energised. The switchrooms will have been through a factory acceptance test process prior to being dispatched to site and the PLC / Scada system will have been tested with the switchboard as a part of the process. Once all of the safety circuits have been tested and verified, the final phase of the energisation process will be release of mains power to each piece of equipment to allow bump testing of the drives.

No Load Commissioning

In no load testing, individual pieces of equipment will be operated and tested with no ore in the system. Conveyor belts will be tracked, lubrication and hydraulic systems verified, and control circuits tested for logic. Each piece of equipment will be operated for a minimum of 4 hrs during which it will be monitored and assessed as being ready for load testing. The final phase of the no load testing will be the sequence interlocking process of all devices.

Load Commissioning

Load testing involves the introduction of ore into the circuit. The process will involve the filling of bins and chutes and hoppers and testing of all feeders and conveyors. All bin levels will be assessed for suitability and compliance with design loadings. All pieces of equipment will be assessed to ensure that power draws and loads are within manufacturer's specifications. Spillage points will be rectified. All auxiliary systems such as dust suppression and air supply will be adjusted to ensure that the plant meets its environmental obligations.

The energisation phase will be completed within 1 week of initial energisation. No load testing and load testing will be completed with a 1 week period.

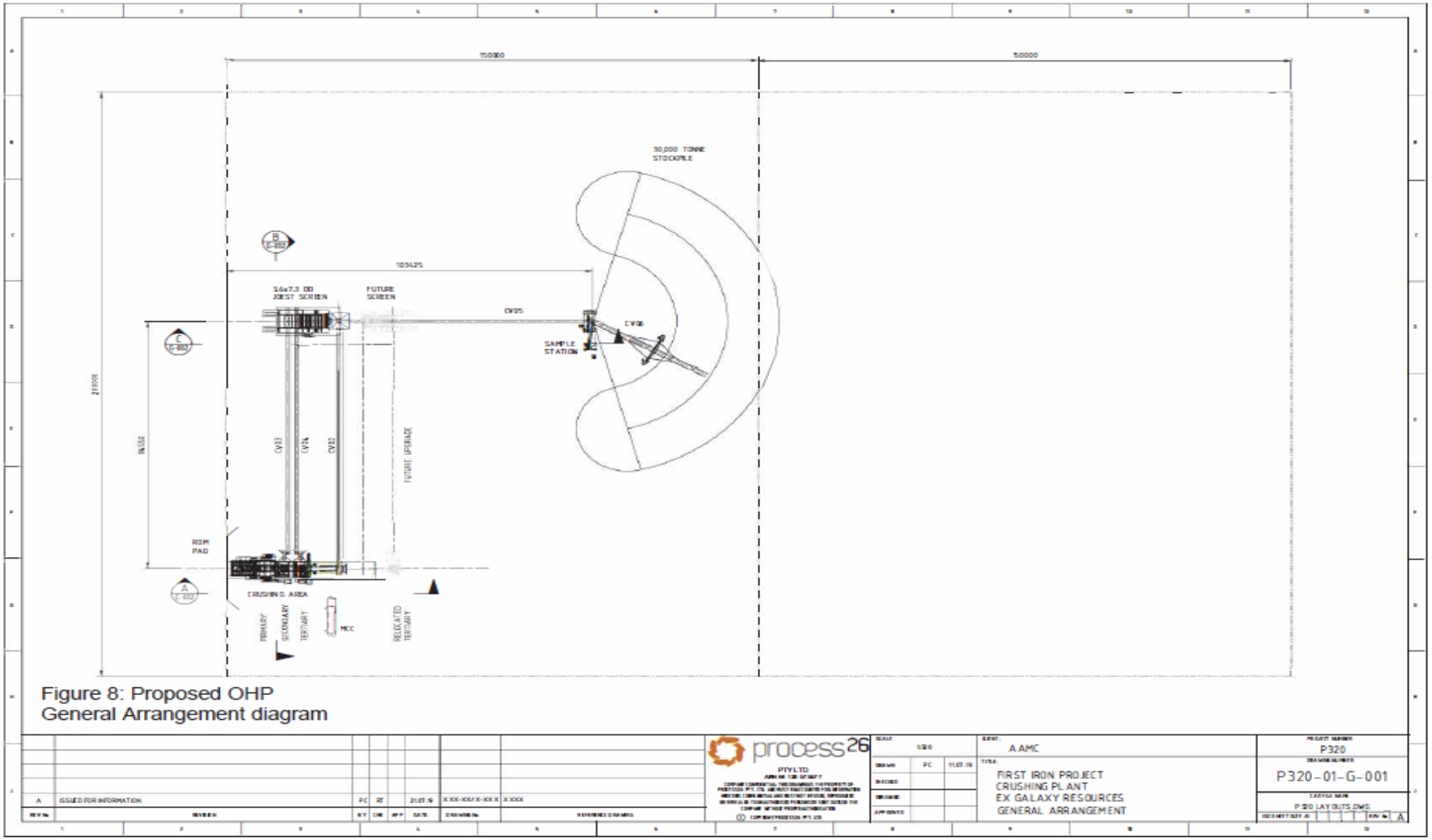

Figure 8: Proposed OHP General Arrangement diagram

Figure 3: OHP general arrangement

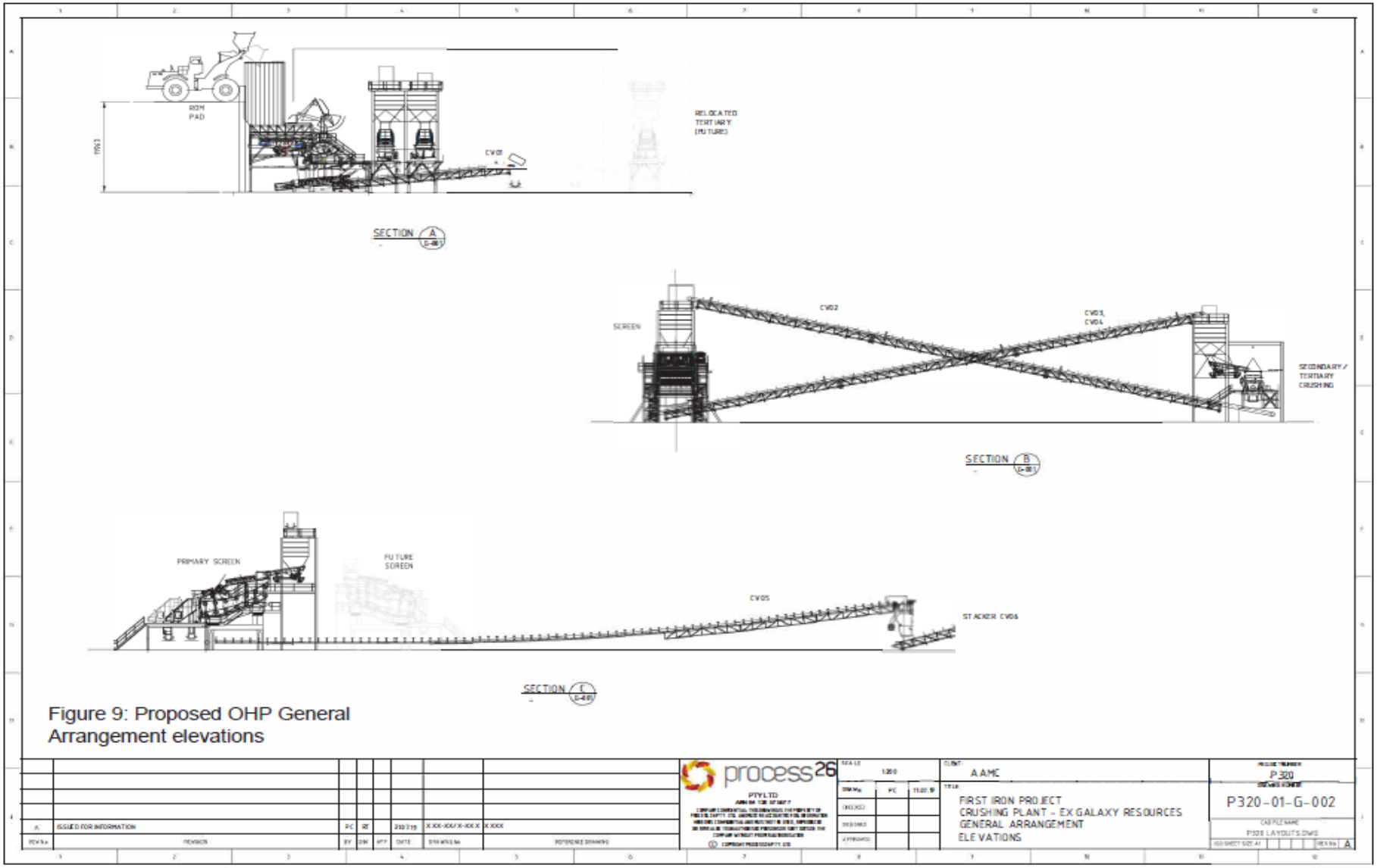

Figure 9: Proposed OHP General Arrangement elevations

Figure 4: OHP general arrangement

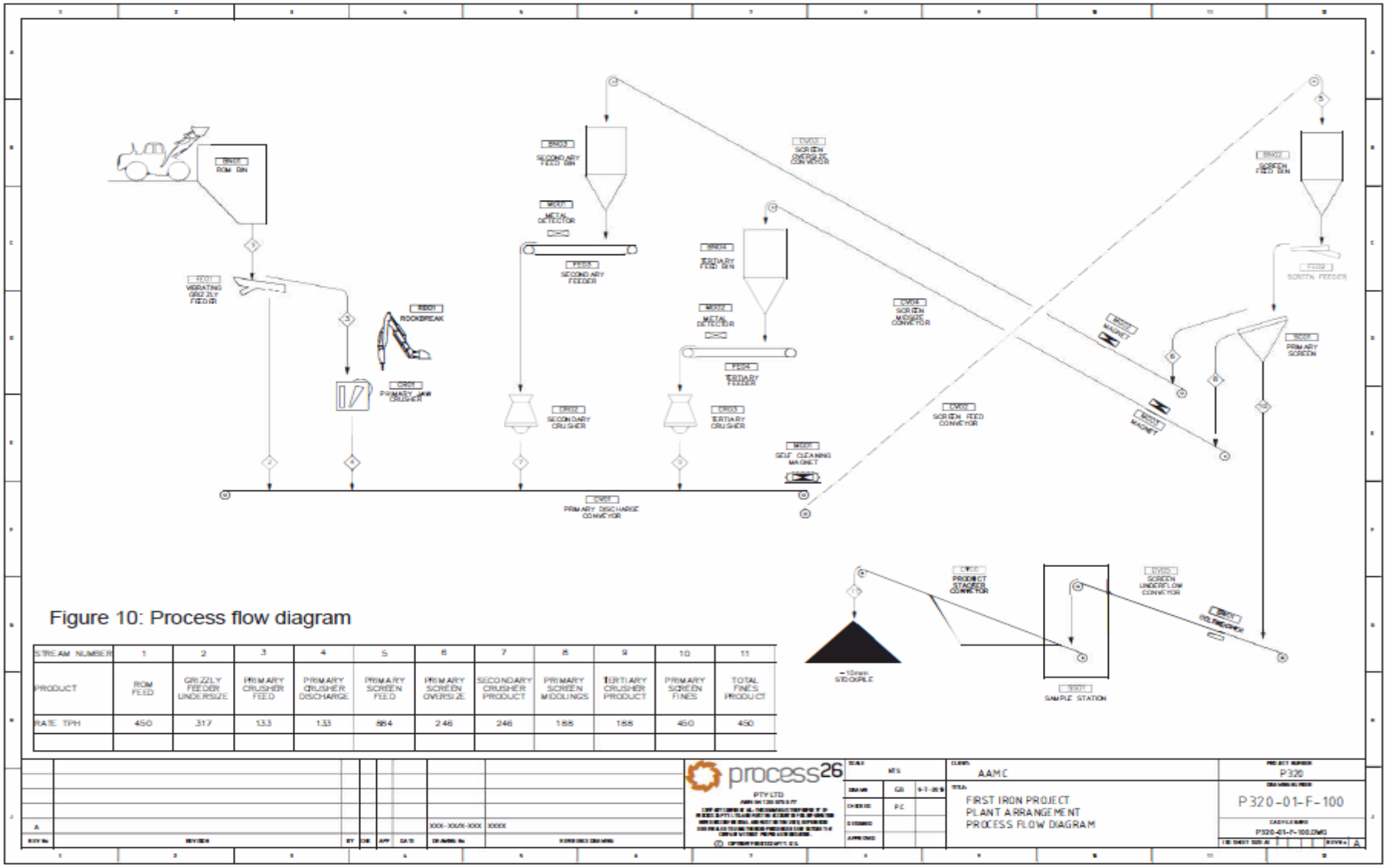

Figure 5: OHP process flow diagram

4.1.2 Wastewater treatment plant

The Project WWTP will be designed to treat and dispose of wastewater generated from up to 120 people at the Project accommodation camp. The estimated maximum throughput of 28.75 m^3/day is based on 250L of wastewater per person generated by approximately 115 people.

Layout drawings for the WWTP are provided in Figure 6 and Figure 7.

WWTP Design

The expected quality of input wastewater is detailed in Table 3.

Table 3: Expected quality of input wastewater

Parameter	Concentration
Biochemical Oxygen Demand (BOD)	**350 mg/L**
Total suspended solids (TSS)	350 mg/L
Total nitrogen (TN)	60 mg/L
Total phosphorus (TP)	14 mg/L
pH	6.5 to 8.5
Total dissolved solids	<600mg/L

The WWTP will consist of an external balance tank and a Submerged Aerated Filter (SAF) system. The system will be prefabricated in-house and fully factory tested by the manufacturer, thus requiring minimal installation at the work site. A purpose-built 12 m containerised unit will be used. The external balance tank will be installed on an impermeable concrete pad. The containerised unit will be installed on a raised, compacted and stabilised earth pad.

The SAF WWTP will be a biological treatment process based on a submerged aerated filter using a fixed film attached biological growth process. It is designed to achieve a consistently high quality effluent.

The WWTP is capable of handling the peak flows typically associated with work and mining camps where the peaks are morning and afternoon/evening.

Treated effluent will be disposed of via a dedicated 0.82 hectare spray irrigation field.

The target treated wastewater parameters are detailed in Table 4. Target concentrations for E.coli, BOD, suspended solids, pH, and chlorine are in line with the low exposure risk level (ERL) (level of human contact) effluent compliance values detailed in *Guidelines for non-potable uses of recycled water in Western Australia (Department of Health, 2011).*

Target concentrations for nitrogen and phosphorus are in line with the minimum level of treatment (Category C) for landscape irrigation detailed in the *National Water Quality Management Strategy (NWQMS), Australian Guidelines for Sewage Systems – Effluent Management (1997).*

Table 4: Target treated wastewater quality

Parameter	Target concentration
Biochemical Oxygen Demand (BOD)	<20mg/L
Total suspended solids (TSS)	<30mg/L
Total nitrogen (TN)	<30mg/L
Total phosphorus (TP)	<8mg/L
pH	6.5 to 8.5
E.coli	<1,000 cfu/100ml
Residual chlorine	0.2 – 2.0 mg/L
Total dissolved solids	<600mg/L

WWTP process description

Wastewater Pump Station and Balance Tanks

Raw wastewater will be pumped via the prefabricated, poly sewerage pump station. This will consist of duty and standby macerator pumps, with the operating pump sized to handle peak flows. Storage of raw wastewater (sewage) will be achieved in the external Balance Tank. This tank is designed to hold the peak flow influent whilst delivering a steady flow to the SAF, allowing for complete treatment over a 24-hour period.

Submerged Aerated Filter (SAF) Process

Sewage will then be pumped into the WWTP and enter via the anaerobic tank. From the anaerobic tank, effluent will then pass through several treatment stages including primary tanks, aeration tank and a disinfection chamber.

Phosphorus removal utilises the anaerobic tank prior to the SAF. Recycled sludge from the final clarifier is mixed with the influent in this stage. Nitrogen removal is then achieved via denitrification in the primary tanks of the SAF where, with no air injected, and the introduction of recycled nitrified effluent from the end of the process, the process becomes anoxic.

The SAF methodology of wastewater treatment utilises a biological treatment process whereby highly aerated effluent flows through inert media that is completely submerged, promoting formation of a fixed microbial film that reduces the BOD and ammonia content of the effluent. A blower sends air to the bottom of the bed to provide oxygen for the biomass to support the oxidation process. The air stream promotes both efficient mixing of the effluent and disturbance of any excess solids from the filter medium.

The biomass from the effluent (sludge) settles out and is then removed and stored separately in a self bunded coagulant tank. The effluent is then filtered and dosed with chlorine to a low ERL quality, prior to discharging into the irrigation tank. Chlorination will occur via automatically loaded tablets at a frequency based on the effluent water quality.

Sludge produced by the WWTP will be removed by a licensed carrier and taken for disposal at an appropriately licensed waste facility in accordance with the *Environmental Protection (Controlled Waste) Regulations 2004.* Sludge will typically be removed every 3 months with an

estimated 4m^3 sludge generated annually.

Treated Wastewater Disposal

Treated wastewater will be disposed of via a non-human contact spray irrigation field (sprayfield). The sprayfield will cover an area of 0.82 hectares and an additional 5 metres spray drift buffer.

The sprayfield area has been sized in accordance with the conditions of approval set out in the DoH approval to construct or install an apparatus for the treatment of sewerage (Approval No: 189.19).

The sprayfield will be enclosed with a 1200 mm high, two strand steel wire fence around the perimeter to restrict access to the area. A danger sign will also be fitted to all sides of the fence. The fence will be a minimum of five metres from the sprinkler spray pattern to allow for spray drift.

Additional area surrounding the sprayfield has been reserved to allow for future expansion if required. This would be due to additional accommodation requirements and the associated increase in throughput to the WWTP.

WWTP spill prevention and management measures

The WWTP incorporates the following to manage the potential for spill events:

- All wastewater storage components will be impermeable;
- Freeboard will be maintained within each WWTP tank;
- Audible and visual alarm activated if high water levels or pump failure is detected;
- External balance tank will be installed on an impermeable concrete pad;
- Regular inspection of pipelines for leaks/damage
- Immediate response to any spill event/s including removal of contaminated soil for transport to a licensed facility.

WWTP commissioning

Commissioning of the WWTP will be undertaken to validate, operate and verify the system. Commissioning will be carried out by a specialist engineer who ensures the WWTP is correctly installed and functioning as per the specifications and regulatory conditions.

Commissioning will include sampling and analysis of influent and effluent samples collected across a minimum period of 12 weeks. The proposed sample and analysis schedule for the commissioning phase is detailed in Table 5.

Commissioning of the WWTP may at times result in discharged wastewater with elevated contaminant concentrations. However, this is only expected over the 12 week (short term) commissioning period.

Table 5: Proposed wastewater monitoring during WWTP commissioning period

Parameter	Influent monitoring frequency	Effluent monitoring frequency
Biochemical Oxygen Demand (BOD)	Not required	Weekly
Total suspended solids (TSS)	Not required	Weekly
Total nitrogen (TN)	Weekly	Weekly
Total phosphorus (TP)	Weekly	Weekly
pH	Continuous online (or weekly)	Continuous online
E.coli	Weekly	Weekly
Residual chlorine	N/A	Continuous online

WWTP treated effluent monitoring

In addition to monitoring of influent and effluent during the commissioning period, the Applicant proposed ongoing monitoring of treated effluent, post-commissioning. The proposed parameters for operational monitoring include those identified in Table 5, with the addition of Total Dissolved solids, Ammonium-Nitrogen, Nitrate and Nitrite Nitrogen.

4.2 Water supply

Water for the prescribed premises will be sourced from abstraction bores which will be constructed on site. The Applicant has advised licences to construct wells and take water will be applied for under the *Rights in Water and Irrigation Act 1914.*

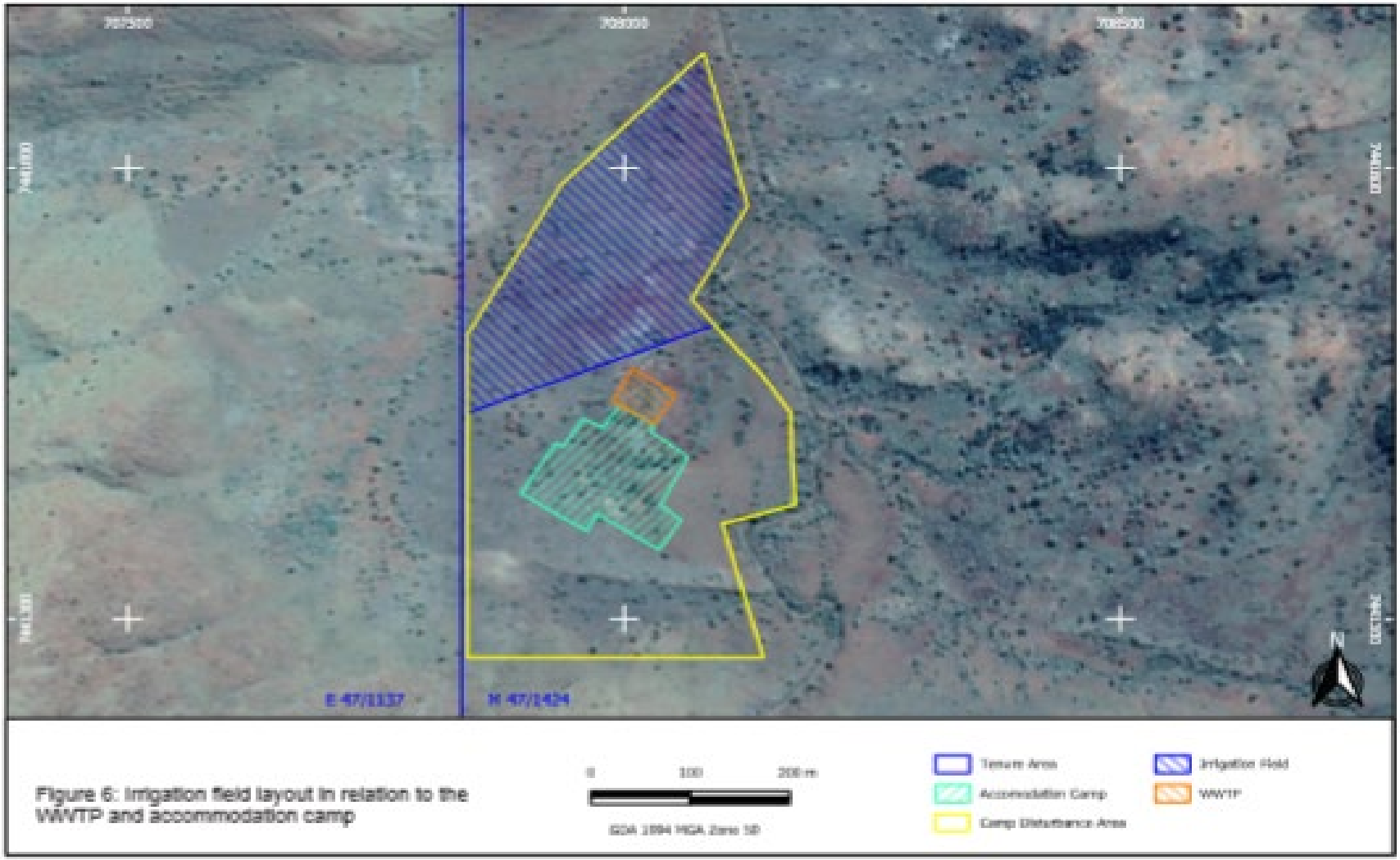

Figure 6: Layout plan for WWTP and sprayfield

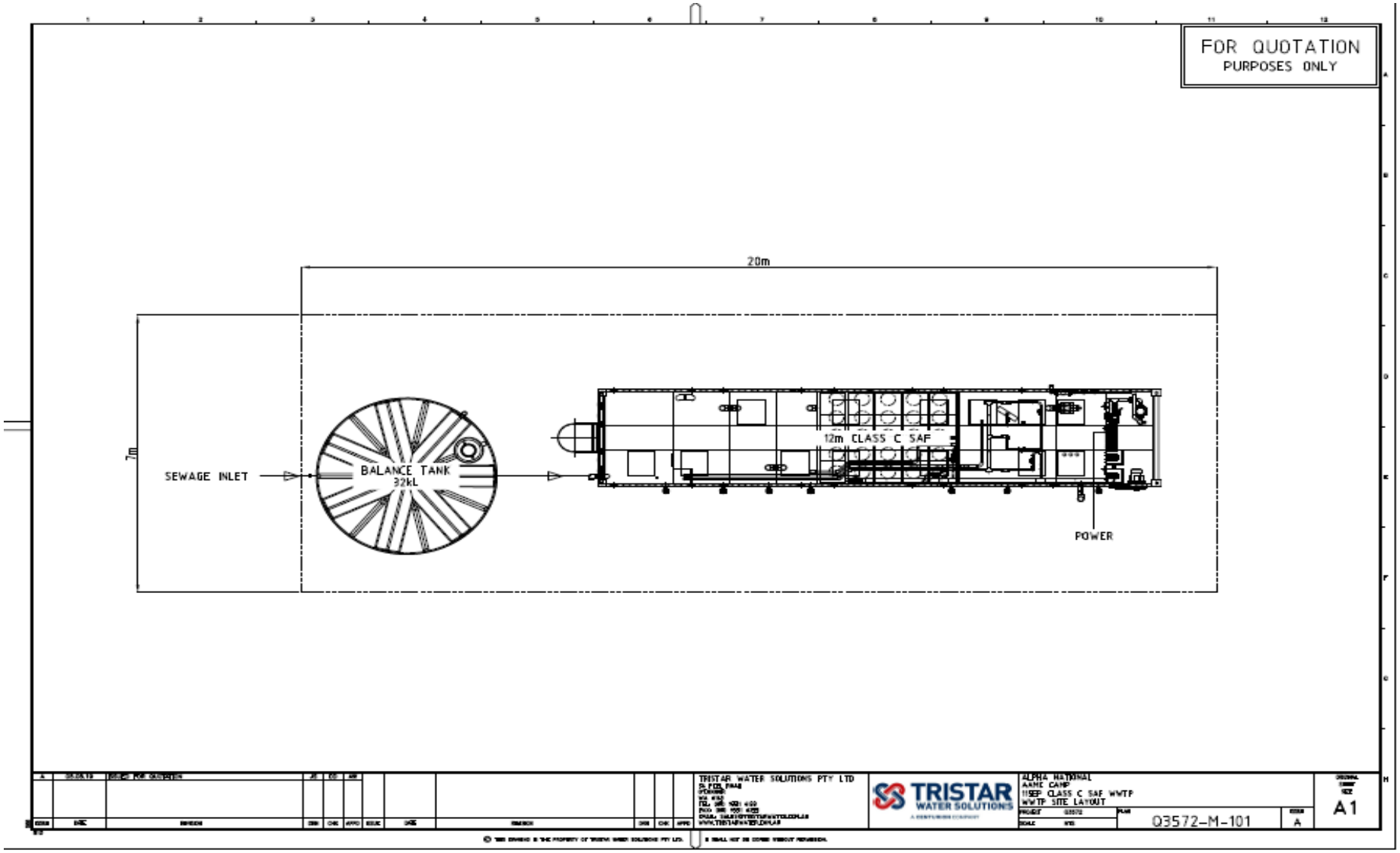

Figure 7: Schematic layout of WWTP

4.3 Infrastructure inventory

The infrastructure relevant to prescribed premises categories 5 and 85 are detailed in Table 6.

Table 6: First Iron Project category 5 and 85 infrastructure

	Infrastructure	Site Plan Reference (in attached works approval)
	Prescribed Activity Category 5	
ORE HANDLING PLANT		
1	Compacted earth pad	Schedule 1: Maps Premises map.
2	ROM Bin	
3	Vibrating grizzly feeder	
4	Primary crusher	
5	Conveyors	
6	Primary screen – double deck banana screen	
7	Secondary crusher	
8	Tertiary crusher	
9	37m radial stacker	
10	Sprinklers fitted on crushers and screens	
11	Shields/covers on conveyors and transfer points.	
	Prescribed Activity Category 85	
WASTE WATER TREATMENT PLANT		
1	WWTP components: ▪ Impermeable concrete pad ▪ External balance tank ▪ Balance pump ▪ Primary 1 tank ▪ Primary 2 tank ▪ Aeration tank with media ▪ Blower ▪ Clarifier, including airlift Return Activated Sludge (RAS) ▪ Disinfection chamber, including tablet chlorinator ▪ Pump out chamber ▪ Sludge tank	Schedule 1: Maps Premises map; WWTP layout map.

	Infrastructure	Site Plan Reference (in attached works approval)
	▪ Control panel ▪ Audible and visual pump fault alarm ▪ Irrigation pump ▪ Discharge flow meter ▪ Treated wastewater pipeline to sprayfield	
2	Sprayfield components: ▪ Above ground hammer type sprinklers ▪ Individual branch line flush valves ▪ Automated control from WWTP irrigation pump ▪ 1200 mm high two-strand steel wire fencing ▪ Safety signage displayed on perimeter fencing	

5. Legislative context

Table 7 summarises approvals relevant to the assessment.

Table 7: Relevant approvals and tenure

Legislation	Number	Proponent	Approval
Mining Act 1978 (WA)	6216/2	Wonmunna Iron Ore Pty Ltd	Clearing Permit – approval dated 17 October 2019 Authorisation to clear up to 555 hectares of native vegetation within tenements M47/1423, M47/1424 and M47/1425
Mining Act 1978 (WA)	Reg ID 82535	Australian Aboriginal Mining Corporation	Approval for First Iron Project Mining Proposal **Addendum –** approval dated 7 January 2020. Approval to commence development and operation of the project.
The Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974	Approval No. 189.19	Tristar Water Solutions Pty Ltd	Approval to construct or install an apparatus for the treatment of sewerage for the Project - dated 15 November 2019.

5.1 *Mining Act 1978 (WA)*

5.1.1 Mining proposal approval and tenement conditions

On 7 January 2020 the DMIRS approved the First Iron Project Mining Proposal Addendum. Approval was given to commence development and operation of the project in accordance with tenement conditions and subject to other authority approvals being obtained.

Tenement conditions (for tenement M47/1424) which are relevant to this assessment include:

Condition 8 - The construction and operation of the project and measures to protect the environment to be carried out in accordance with the document titled:

- (MP Reg ID 53252) "Mining Proposal Wonmunna Iron Ore Project M47/1423, M47/1424, M47/1425 and L47/727" dated 25 March 2015 signed by Andrew Caruso and retained on the Department of Mines and Petroleum File No. EARS-MPMCP-53252 as Document ID 3490123;
- (MCP Reg ID 53252) "Mine Closure Plan Wonmunna Iron Ore Project M47/1423, M47/1424, M47/1425 and L47/727" dated 25 March 2015 signed by Andrew Caruso and retained on the Department of Mines and Petroleum File No. EARS-MPMCP-53252 as Document ID 3490124;
- (MP Reg ID: 82535) "First Iron Project Mining Proposal Addendum (Rev 2)" dated 5 December 2019 signed by Fergus Campbell, and retained on Department of Mines, Industry Regulation and Safety File No. EARS-MP-82535 as Doc ID 7037601.

Condition 14 – The Lessee taking all reasonable measures to prevent or minimise the generation of dust from all materials handling operations, stockpiles, open areas and transport activities.

Condition 18 – The Lessee submitting to the Executive Director, Environment Division, DMIRS, a brief annual report outlining the project operations, minesite environmental management and rehabilitation work undertaken in the previous 12 months and the proposed operations, environmental management plans and rehabilitation programmes for the next 12 months. The report is to be submitted each year in April.

5.2 Part V of the EP Act

5.2.1 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: Regulatory Principles (July 2015)*
- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Licence Duration (August 2016)*
- *Guideline: Decision Making (June 2019)*
- *Guidance Statement: Risk Assessments (February 2017)*
- *Guidance Statement: Environmental Siting (November 2016)*

6. Consultation

The Delegated Officer notes that Clearing Permit 6216/2 and the Mining Proposal have been approved by DMIRS and the project was not formally assessed by the EPA. The details and outcomes of external consultation undertaken by DWER is summarised in Table 8 below.

Table 8: Summary of external consultation

Method	Summary of comments received	DWER response
Request for comment issued to DMIRS	Mining Proposal (MP) Reg ID 82535 was the second MP for this project, and sought approval for an amended project design and layout. The approval letter for the MP (Reg ID 82535) is attached (Attachment 1). Works Approval W6358 is consistent with the approved MP Reg ID 82535. DMIRS do not have any objections to the content or scope of the Works Approval.	Noted
Request for comment issued to DBCA	No submission received	Noted
Request for comment issued to Shire of East Pilbara	No submission received	Noted
Advertising of the application was undertaken on 23 March 2020 in the West Australian and the DWER website	No submissions were received	Noted

7. Risk events

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.

7.1 Emissions

Key emissions associated with the construction and/or operation of the Ore Handling Plant are:

- Noise;
- Dust;
- Light; and
- Sediments – in stormwater discharged from the OHP and stockpile area following storm events.

Key emissions associated with the operation of the WWTP are:

- Untreated sewage spilled from the WWTP;
- Treated wastewater discharged at the spray irrigation field; and

- Treated wastewater runoff from the spray irrigation field.

7.2 Sensitive land uses

DWER's GIS indicates there are no aboriginal communities and pastoral stations in the vicinity of the premises. The nearest town is Newman located approximately 74kms south-east of the premises boundary.

There are no residences locally that would be impacted by emissions from the OHP and WWTP.

7.3 Specified ecosystems and other environmental receptors

Specified ecosystems are areas of high conservation value and special significance that may be impacted as a result of activities at or Emissions and Discharges from the Premises.

The location/distances to specified ecosystems and other relevant ecosystem values (which do not fit the definition of a specified ecosystem) are shown in Table 9 and Table 10.

Screening of potential risk events is outlined in Table 9 and Table 10.

Table 9: Potential environmental receptors relevant to Category 5 activity (Ore Processing Plant)

Specified ecosystems/biota	Approximate location and/or distance from prescribed activity	Screening for Risk Event
Falco hypoleucos (Grey falcon)[2] - Vulnerable	Weeli Wolli creek[3] 480m to the east of the OHP and ROM pad footprint	Screened out. OHP construction and operational noise is not expected to impact conservation significant fauna which may occur at Weeli Wolli creek, due to the separation distance of 480m or greater.
Rhinonicteris aurantia (Orange leaf-nosed bat)[2] – Priority 4; *Rhinonicteris aurantia* (Pilbara) (Pilbara leaf-nosed bat) – Vulnerable; *Macroderma gigas* (Ghost bat)[2] – Vulnerable	Weeli Wolli gorge/creek[3]	Screened out. Assessment considered that light spill from the project may potentially have an adverse impact on bat species that may occur within Weeli Wolli gorge/creek (located at least 480m to the east of the OHP). This potential risk event has been screened out as it is considered to be assessed and regulated under the *Mining Act 1978.* The Applicant is required to comply with Condition 8 for mining lease M47/1424.
Dasyurus hallucatus (Northern Quoll)[2] – Endangered	Within the project area[3]	Potential receptor to noise emissions from the OHP construction/operation.
Pseudomys chapmani (Western Pebble Mound Mouse)[1] – Priority 4	Population located across the north-east section of the project area[3]	Potential receptor to noise emissions from the OHP construction/operation.
Leggadina lakedownensis (Northern short tailed mouse)[2] – Priority 4	Within the project area[3]	Potential receptor to noise emissions from the OHP construction/operation.

Underwoodisaurus seorsus (Pilbara barking gecko)[2] – Priority 2	Within the project area[3]	Potential receptor to noise emissions from the OHP construction/operation.
Anilios ganei (Gane's blind snake)[2] – Priority 1	Weeli Wolli creekline[3] 480m to the east of the OHP and ROM pad footprint	Screened out. OHP construction and operational noise is not expected to impact conservation significant fauna which may occur at Weeli Wolli creek, due to the separation distance of 480m or greater.
Liasis olivaceus barroni (Pilbara olive python)[2] - Vulnerable	Weeli Wolli gorge[3]	Screened out. OHP construction and operational noise is not expected to impact conservation significant fauna which may occur at Weeli Wolli creek, due to the separation distance of 480m or greater.
Other environmental receptors		
Native fauna	In areas surrounding the OHP footprint	Potential receptor to noise emissions from the OHP construction/operation.
Native vegetation	In areas surrounding the OHP footprint	Potential receptor. Dust emissions from the OHP may impact the condition of native vegetation over the 11 year life of the operation.
Native vegetation	Weeli Wolli creek - 480m to the east of the OHP and ROM pad footprint.	Screened out. Potential dust emissions from the OHP operation are not expected to impact riparian vegetation at Weeli Wolli creek, due to the separation distance of 480m or greater.
Weeli Wolli creek Weeli Wolli creek pool (known as Forgotten Pool)	480m to the east of the OHP and ROM pad footprint. 550m to the south-east of the OHP and ROM pad footprint	Screened out. Assessment identified the potential for sediment discharge from the OHP following storm events. Should a pathway exist between the OHP and Weeli Wolli creek an increase in sediment discharge to Welli Wolli creek and Forgotten Pool may occur. This potential risk event has been screened out as it is considered to be assessed and regulated under the *Mining Act 1978.* The Applicant is required to comply with Condition 8 for mining lease M47/1424 and the associated project Surface Water Management Plan which addresses the specified risk event.

1 - Conservation significant fauna recorded at the project by Phoenix Environmental Sciences (July, 2014).

2 - Conservation significant fauna deemed a moderate likelihood of occurrence at the project by Phoenix Environmental Sciences (July, 2014).

3 - Approximate location as indicated by Phoenix Environmental Sciences (July, 2014).

Table 10: Potential environmental receptors relevant to Category 85 activity (Waste Water Treatment Plant)

Environmental receptors	Approximate location and/or distance from prescribed activity	Screening for risk event
Soils	In the vicinity of WWTP footprint Within sprayfield footprint	Potential receptor.
Native vegetation	In the vicinity of WWTP footprint Within sprayfield footprint	Potential receptor.
Unnamed ephemeral creek	100m east of the WWTP footprint 20m east of the WWTP sprayfield footprint	Potential receptor.
Groundwater	The depth of the mine pit within tenement M47/1424 is expected to be 50m deep and 5m above the water table. The WWTP sprayfield area appears to be at a lower elevation in the landscape, nonetheless the water table is estimated to occur at a significant depth of approximately 20mbgl.	Screened out. Impacts on groundwater are not expected due to the method of effluent application; high evaporation rates and the depth to groundwater at the site.

8. Risk assessment

8.1 Assessment of risk events

The assessment of risk events related to construction and operations is addressed separately in Table 11 and Table 12 below.

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

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 and regulatory controls. The conditions of the Works Approval will be set to give effect to the determined regulatory controls.

The Works Approval that accompanies this report authorises construction and operations under a time limited operations phase only. Following completion and compliance with the Works Approval, a prescribed premises Licence will be required to authorise emissions associated with the operation of the premises. The Licence conditions will not be finalised until DWER assesses the Licence application.

Table 11. Identification of emissions, pathway and receptors *during construction*

Risk Event				Consequence rating	Likelihood rating	Risk	Reasoning	Regulatory controls
Source/Activities	**Potential emissions**	**Potential receptors, pathway and impact**	**Applicant controls**					
Category 5: Construction of ore handling pad and plant.	Noise	**Pathway:** Air **Receptor:** Conservation significant and other fauna in the vicinity of the OHP **Impact:** Localised displacement of fauna	▪ Noise emissions to be managed in accordance with the *Environmental Protection (Noise) Regulations 1997;* ▪ Regular servicing/maintenance of equipment.	Slight	Possible	Low	Potential receptors include conservation significant species that may occur within the Project area. These include: - Northern Quoll (Endangered) - Northern short-tailed mouse (Priority 4) - Western Pebble Mound Mouse – (Priority 4) - Pilbara barking gecko (Priority 2) Construction noise may cause the localised displacement of the above and other native fauna, if they occur in the vicinity of the OHP. However it is likely that general mining activity would render the construction noise indistinguishable from other mining noise. Considering the relatively small scale of the OHP footprint, a consequence rating of slight has been determined.	The risk event is acceptable subject to regulatory controls summarised below. **WORKS APPROVAL CONTROLS** **Construction requirements** The OHP is required to be constructed in accordance with the application documents, particularly in regard to: ▪ Scale and location.
Category 5: Construction of ore handling pad and plant.	Dust	**Pathway:** Air/wind dispersion **Receptor:** Native vegetation / fauna habitat in areas surrounding the OHP footprint **Impact:** Degradation of vegetation condition and fauna habitat over time	▪ Siting – the OHP is to be located approximately 480m (or greater) to the west of Weeli Wolli Creek; ▪ Water trucks will be used to manage dust emissions from cleared areas and roads; ▪ Vehicle speed limits; ▪ Monitoring of operational and weather conditions to support dust management; ▪ Incident reporting system.	Slight	Rare	Low	Dust emissions from the construction of the OHP are expected to be short-term and are not expected to have a significant impact on native vegetation and fauna habitat in areas surrounding the OHP footprint.	The risk event is acceptable subject to regulatory controls summarised below. **WORKS APPROVAL CONTROLS** **Construction requirements** The OHP is required to be constructed in accordance with the application documents, particularly in regard to: ▪ Scale and location.

Table 12: Identification of emissions, pathway and receptors *during commissioning and operations*

Risk Event				Consequence rating	Likelihood rating	Risk	Reasoning	Regulatory controls
Source/Activities	**Potential emissions**	**Potential receptors, pathway and impact**	**Applicant controls**					
Category 5 **Commissioning and operation of OHP, i.e** - **Crushing and screening of ore;** - **Stockpiling of ore**	Noise	**Pathway:** Air **Receptor:** Conservation significant and other fauna in the vicinity of the OHP **Impact:** Localised displacement of fauna	▪ Noise emissions to be managed in accordance with the *Environmental Protection (Noise) Regulations 1997;* ▪ Noise attenuating equipment will be used, where practicable, to minimise noise during operation. ▪ Regular servicing/maintenance of equipment.	Slight	Possible	Low	Potential receptors include conservation significant species that may occur within the Project area. These include: - Northern Quoll (Endangered) - Northern short-tailed mouse (Priority 4) - Western Pebble Mound Mouse – (Priority 4) - Pilbara barking gecko (Priority 2) Operational noise may cause the localised displacement of the above and other native fauna, if they occur in the vicinity of the OHP. However general mining activity is likely to deter fauna from entering the active operations area. Considering the relatively small scale of the OHP, a consequence rating of slight has been determined.	The risk event is acceptable subject to regulatory controls summarised below. **WORKS APPROVAL CONTROLS** **Construction requirements** The OHP is required to be constructed in accordance with the application documents, particularly in regard to: ▪ Scale and location; ▪ Design/production capacity. **Completion and submission of Environmental Compliance Report** **LICENCE CONTROLS** (INDICATIVE ONLY) Prescribed premises details Provision of Annual Audit Compliance Report and Annual Environmental Report.

Risk Event				Consequence rating	Likelihood rating	Risk	Reasoning	Regulatory controls
Source/Activities	**Potential emissions**	**Potential receptors, pathway and impact**	**Applicant controls**					
Category 5 **Commissioning and operation of OHP, i.e** - **Crushing and screening of ore;** - **Stockpiling of ore**	Dust	**Pathway:** Air/wind dispersion **Receptor:** Native vegetation / fauna habitat in areas surrounding the OHP footprint **Impact:** Degradation of vegetation condition and fauna habitat over time	▪ Siting – the OHP is to be located approximately 480m (or greater) to the west of Weeli Wolli Creek. ▪ OHP design includes components to manage dust including - sprinklers on crushers and screens and shields/covers on conveyors and transfer points. ▪ Monitoring of wind and operational conditions. ▪ Water trucks will be used to manage dust emissions at the ore stockpile area, hardstand areas and bare areas. ▪ Incident reporting system.	Moderate	Unlikely	Medium	Dust emissions from the OHP may impact the condition of the surrounding environment over the 11 year life of the operation. However, the OHP is relatively small in scale compared to the Project development envelope and is not expected to be a major source of dust emissions. The scale of the OHP and the applicant's dust management measures are considered to reduce the likelihood of the risk event to a rating of *unlikely*.	The risk event is acceptable subject to regulatory controls summarised below. **WORKS APPROVAL CONTROLS** **Construction requirements** The OHP is required to be constructed in accordance with the application documents, particularly in regard to: ▪ Scale and location; ▪ Design/production capacity; ▪ Dust emission controls. **Completion and submission of Environmental Compliance Report** **LICENCE CONTROLS** (INDICATIVE ONLY) Prescribed premises details Operation and maintenance of sprinkler systems on crushing and screening plant Use and maintenance of covers and shields on conveyors and transfer points in the Ore Handling Plant Operation of water trucks to manage dust emissions from the ore stockpile, hardstand and bare areas. Provision of Annual Audit Compliance Report and Annual Environmental Report.

Risk Event				Consequence rating	Likelihood rating	Risk	Reasoning	Regulatory controls
Source/Activities	**Potential emissions**	**Potential receptors, pathway and impact**	**Applicant controls**					
Category 85 **Commissioning and operation of WWTP**	Untreated sewage spilled from the WWTP	**Potential receptors:** Soils; Native vegetation; Ephemeral creek (downstream) **Pathway:** Overland flow. **Impacts:** Soil/sediment contamination; Adverse impact on vegetation health.	The WWTP is a closed system designed to treat up to 30m^3 of raw sewage per day. The WWTP incorporates the following to manage the potential for spill events. ▪ All wastewater storage components will be impermeable; ▪ Freeboard will be maintained within each WWTP tank; ▪ Audible and visual alarm activated if high water levels or pump failure is detected; ▪ External balance tank will be installed on an impermeable concrete pad; ▪ Regular inspection of pipelines for leaks/damage ▪ Immediate response to any spill event/s including removal of contaminated soil for transport to a licensed facility.	Slight	Unlikely	Low	A spill of raw sewage from the WWTP is expected to impact soils and remnant native vegetation in the vicinity of the WWTP only. A consequence rating of slight has therefore been determined. As the WWTP is designed to be a closed system a spill event is not expected to occur in most circumstances.	The risk event is acceptable subject to regulatory controls summarised below. **WORKS APPROVAL CONTROLS** **Construction requirements** WWTP to be constructed in accordance with the application documents, particularly in regard to: ▪ Scale and location; ▪ Spill/seepage prevention components. **Submission of Environmental Compliance Report** **LICENCE CONTROLS** (INDICATIVE ONLY) Maintain the WWTP infrastructure in good working order; Weekly inspection of pipelines to ensure pipeline integrity.

Risk Event				Consequence rating	Likelihood rating	Risk	Reasoning	Regulatory controls
Source/Activities	**Potential emissions**	**Potential receptors, pathway and impact**	**Applicant controls**					
	Treated wastewater discharged at irrigation sprayfield	**Potential receptors:** Soils and native vegetation (within sprayfield area) **Pathway:** Direct contact **Impact:** Elevated levels of salts and nutrients; Adverse impact on vegetation health; Establishment of weed species.	Monitoring of effluent quality to verify the WWTP performance.	Slight	Possible	Low	Over the life of the operation (11 years), elevated levels of salts and nutrients may occur within the sprayfield area and impact vegetation condition. Due to the relatively small scale of the sprayfield (approx. 0.82 hectares), and as no conservation significant vegetation are understood to occur in the area, a consequence rating of slight has been determined.	The risk event is acceptable subject to regulatory controls summarised below. **WORKS APPROVAL CONTROLS** **Construction requirements** WWTP and sprayfield to be constructed in accordance with the application documents, particularly in regard to: ▪ Scale and location; ▪ WWTP design to achieve target effluent quality. **Submission of Environmental Compliance Report** **Submission of Environmental Commissioning Report** **LICENCE CONTROLS** (INDICATIVE ONLY) Prescribed premises details Monitoring of effluent quality Provision of Annual Audit Compliance Report and Annual Environmental Report.

Risk Event				Consequence rating	Likelihood rating	Risk	Reasoning	Regulatory controls
Source/Activities	**Potential emissions**	**Potential receptors, pathway and impact**	**Applicant controls**					
	Treated wastewater runoff from sprayfield	**Potential receptors:** Soils and native vegetation in the vicinity of the sprayfield; Ephemeral creek (downstream) **Pathway:** Runoff from sprayfield **Impact:** Elevated levels of salts and nutrients in soils; Adverse impact on vegetation health; Establishment of weed species.	▪ Discharge of treated wastewater only; ▪ Monitoring of effluent quality to verify the WWTP performance; ▪ Discharge via a 0.82 hectare sprayfield consisting of an above ground sprinkler system.	Minor	Rare	Low	Run off from the sprayfield area is not expected to occur due to the effluent application method and expected evaporation at the site. In the unlikely event runoff from the sprayfield occurs the impacts are expected to be minimal and local in scale.	The risk event is acceptable subject to regulatory controls summarised below. **WORKS APPROVAL CONTROLS** **Construction requirements** WWTP and sprayfield to be constructed in accordance with the application documents, particularly in regard to: ▪ WWTP design to achieve target effluent quality; ▪ Sprayfield location, sizing and components. **Submission of Environmental Compliance Report** **Submission of Environmental Commissioning Report** **LICENCE CONTROLS** (INDICATIVE ONLY) Weekly inspection of integrity of effluent pipeline and discharge sprayfield

9. Applicant's comments

A draft decision report and draft works approval were issued to the Applicant on 10 June 2020. Comments were received from the Applicant on 16 July 2020 which are summarised in Appendix 2, along with DWER's response.

10. 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 (summarised in Appendix 1).

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

Alana Kidd

Digitally signed by Alana Kidd
Date: 2020.07.24 14:17:14 +08'00'

Alana Kidd
Manager, Resource Industries
Delegated Officer
under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key documents

Document title	In text ref	Availability
Works approval application including: 1. Application form dated 28/11/2019 2. Supporting document ref AAM-FIP-WAA-01, rev 0, dated 28/11/2019 3. Supplementary documents including: - Mining Proposal, Wonmunna Iron Ore Project, March 2015 - Clearing Permit 6216/2 granted under the Environmental Protection Act 1986 - Wonmunna Iron Ore Project Surface Water Management Plan, October 2015. Including Addendum dated 27/11/2019 - Flora and Vegetation Survey of the Wonmunna Area, 2014 - Level 2 Vertebrate fauna survey for the Wonmunna Iron Ore Project, July 2014 - Level 2 Short-range endemic invertebrate fauna survey for the Wonmunna Iron Ore Project, October 2014 - Troglofauna survey for the Wonmunna Iron Ore Project, October 2014.	Application	A1847270; A1847273
Request for advice issued to EPA Services, 12 March 2020; Responses from EPA Services, 20 March 2020 and 28 April 2020	N/A	A1875966; A1888501
Submission received from the Department of Mines, Industry Regulation and Safety, 24 March	N/A	A1878954

2020		
First Iron Project Mining Proposal Addendum (rev 2), 5 December 2019	N/A	https://minedex.dmirs.wa.gov.au/Web/environment-registrations/details/82535
Submission from applicant – comments regarding draft works approval and draft decision report. Received 16 July 2020.	N/A	A1914459

Appendix 2: Summary of applicant's comments on risk assessment and draft conditions

Condition / Report section	Summary of Licence Holder comment	DWER response
Condition 1, Table 1 – WWTP design and construction/installation requirements	A flow meter will only be installed on the discharge side of the WWTP. This is consistent with the supporting documentation that was submitted with the application. We have not contemplated and do not consider a flow meter on the input side to be warranted, required or reasonable. A meter on the input side would be costly and problematic as it would have a number of operations and maintenance issues.	DWER has considered the requirement for the installation of a flow meter at the WWTP inlet and removed this requirement from Works Approval Condition 1. However, the Applicant is required to install a flow meter to record discharge volumes from the WWTP during commissioning and time limited operations.
Schedule 2: Premises boundary	Premises boundary coordinates provided in Note 1 of submission.	The assessed premises boundary is consistent with the premises boundary coordinates submitted by the Applicant. The premises boundary is defined in Schedule 1 and Schedule 2 of the Works Approval.
Section 4.1.1 Ore handling plant	The Applicant provided comments regarding the OHP commissioning process and timeframe for commissioning. *A summary of comments is provided in Section 4.1.1 of this report.*	DWER has assessed potential emissions associated with the commissioning of the OHP. Commissioning of the OHP can be undertaken under the Works Approval subject to compliance reporting and time limited operations conditions detailed in the Works Approval.
Section 4.1.1 WWTP design	Comments regarding WWTP input wastewater: Influent BOD is 350mg/L, Effluent BOD is <30mg/L. TDS < 600mg/l (this is the aesthetic value required for good drinking water)	Noted. In regard to BOD for treated wastewater the application noted a target BOD of <20mg/L. DWER understands the WWTP is designed to achieve this target and Works Approval conditions have been set accordingly.

Condition / Report section	Summary of Licence Holder comment	DWER response
	E.Coli: Influent N/A , Effluent < 1000 cfu/100ml	
Section 4.1.1 WWTP design	WWTP & Tanks typically do not need to be installed on concrete pad. Prior to construction a geotechnical expert advise if there is this need or if a simple compacted level earth pad will be sufficient to hold the weight of the WWTP equipment. Note that on page 37 of the application's supporting document we have stated that the tanks would be place on concrete pads.	DWER understands the WWTP will consist of an external balance tank installed on an impermeable concrete pad and the remaining WWTP components will be installed on a compacted earth pad. In addition, DWER understands the installation of bunding around the WWTP is not proposed. DWER has considered the scale/siting of the WWTP and measures to prevent spills. A low risk rating has been determined in regard to potential spillage of untreated sewage. The Applicant is required to install the WWTP as specified including components to prevent spills.
Section 4.1.2 WWTP design	Comment regarding expected TDS of treated wastewater: The water will be that of potable drinking requirements as per the Australian Drinking Water Guidelines with an aesthetic TDS value of <600mg/L	Noted. The Applicant is required to monitor the quality of treated wastewater during commissioning and time limited operations, and to report the outcomes of this monitoring to DWER as detailed in the Works Approval conditions.
Section 4.1.2 WWTP commissioning	Comment regarding monitoring of total nitrogen during commissioning of the WWTP: The first 6-12 weeks sampling will be conducted on a weekly basis until compliance is regularly achieved and the plant is optimized. From there monthly sampling will be carried out.	Noted. The Applicant is required to analyse the total nitrogen concentration of treated wastewater on a weekly basis during the commissioning period as detailed in Condition 6. During time limited operations, monthly analysis is required as detailed in Condition 12.
Section 4.1.2 WWTP commissioning	Comment regarding monitoring of total phosphorus during commissioning of the WWTP: The first 6-12 weeks sampling will be conducted on a weekly basis until compliance is regularly achieved and	Noted. The Applicant is required to analyse the total phosphorus concentration of treated wastewater on a weekly basis during the commissioning period as detailed in Condition 6.

Condition / Report section	Summary of Licence Holder comment	DWER response
	the plant is optimized. From there monthly sampling will be carried out.	During time limited operations, monthly analysis is required as detailed in Condition 12.
Figure 8: Schematic layout of WWTP	Higher resolution image provided	Noted. Higher resolution image included in Figure 7 of this report.

Attachment 1: Issued Works Approval W6358/2020/1