Iluka Eneabba Temporary Construction Camp

Waste Water Treatment Plant

Works Approval Application

Supporting Information

30 August 2024

Iluka Eneabba Pty Ltd

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Authorisation

Version	Reason for Issue	Prepared	Authorised	Date
0	Final Report	[redacted]		30 August 2024

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Abbreviations

Acronym	Meaning
BoD	Biological Oxygen Demand
BoM	Bureau of Meteorology
COD	Chemical Oxygen Demand
DBCA	Department of Biodiversity, Conservation and Attractions
DJTSI	Department of Jobs, Tourism, Science and Innovation
DMIRS	Department of Mines, Industry Regulation and Safety
DoH	Department of Health
DWER	Department of Water and Environmental Regulation
EMP	Eneabba Monazite Stockpile
EP Act	*Environmental Protection Act 1986*
ERER	Eneabba Rare Earth Refinery
ERL	Exposure Risk Level
GDE	Groundwater Dependent Ecosystem
HMC	Heavy Mineral Concentrate
HSEC	Health, Safety, Environment and Communities
Iluka	Iluka Eneabba Pty Ltd
MSC	Mineral Sands Concentrate
PASS	Potential Acid Sulfate Soils
SWC	Soil Water Consultants
TLO	Time Limited Operations
WWTP	Waste Water Treatment Plant
YSCR	Yamatji Southern Regional Corporation (YSRC)

1. PURPOSE AND SCOPE OF WORKS APPROVAL

Iluka Eneabba Pty Ltd (Iluka), is seeking a Works Approval to construct, commission and operate a Temporary Construction Camp located within the Eneabba Mineral Sands Mine (the mine site). The mine site is already a prescribed premises and operates under Licence L5646/1994/10, Category 8: Mineral sands mining or processing and Category 63: Class I inert landfill site.

The purpose of the Works Approval Application is to assess and seek authorisation under Part V of the *Environmental Protection Act 1986* (EP Act) to undertake the following activities (all to be captured under Category 54):

- construction of a Wastewater Treatment Plant (WWTP) and associated infrastructure (Section 3);
- commissioning of the WWTP (Section 4); and
- time-limited operations of the WWTP until such a time that the Licence is granted (Section 4.1).

The Eneabba Temporary Construction Camp is necessary to manage peak construction workforce for an estimated period of 12-18 months. The Camp will be decommissioned after this peak period.

This report has been prepared to provide supporting information to the "Application for a Works Approval" for this Project, in accordance with Section 54 of the EP Act.

1.1 Proponent Details

The occupier (the Licensee) of the land subject to this Works Approval Application is:

Iluka Eneabba Pty Ltd
Level 17, 240 St Georges Terrace
PERTH WA 6000
T: +61 8 9360 4700
www.iluka.com
ACN: 008 675 018

The nominated Iluka representative for this Works Approval Application is:

[redacted]
Principal Environmental Advisor – Approvals WA
T: +61 8 9360 4652 | M: [redacted]
E: Ben.Kraft@iluka.com

A copy of the occupier status (extracted from the Mineral Titles Online Database) providing evidence of Iluka as the tenement holder, including the tenement expiry is provided in Attachment 1A. A copy of the ASIC company information extract as required by the Works Approval Application form is provided in Attachment 1B.

2. BACKGROUND

The Eneabba mine site is an existing large scale, heavy mineral sands mine located approximately 300 km north of Perth (Figure 1). Table 1 lists the prescribed premises categories on the existing site Licence L5646/1994/10.

Table 1: Eneabba Prescribed Premises Categories

Prescribed premises category description (Schedule 1, *Environmental Protection Regulations 1987*)	Assessed production capacity
Category 8: Mineral sands mining or processing: premises on which mineral sands ore is mined, screened, separated or otherwise processed.	18,600,000 tonnes per annual period
Category 63: Class I inert landfill site: premises on which waste (as determined by referenced to the waste type set out in the document entitled "Landfill Waste Classification and Waste Definitions 1996" published by the CEO and as amended from time to time) is accepted for burial.	10,000 tonnes per annual period

2.1 Overview of Premises

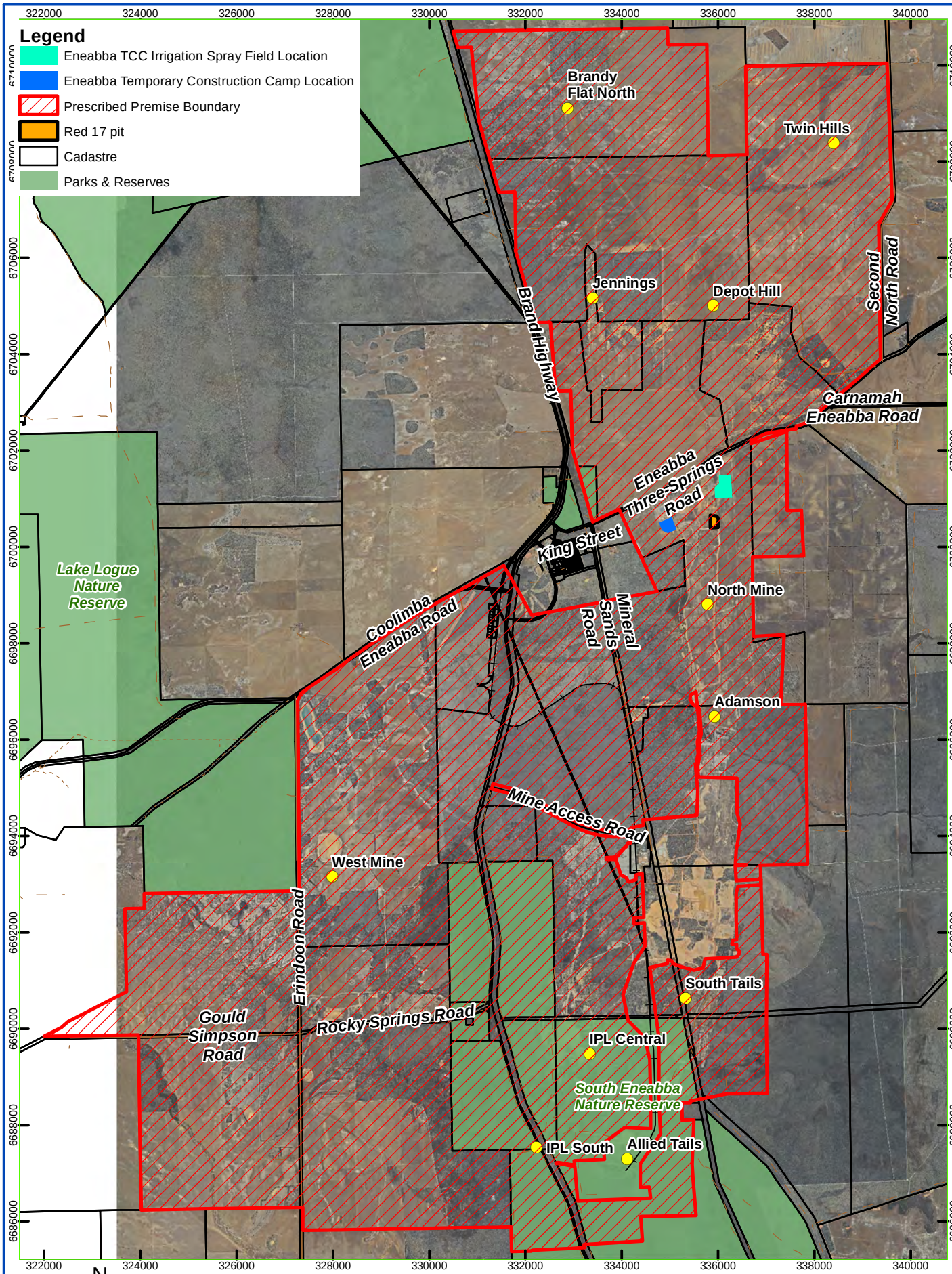
Open pit mining at Eneabba started in the 1970s in accordance with the *Mineral Sands (Eneabba) Agreement Act 1975*. ML 267SA is held by Iluka Eneabba Pty Ltd, a wholly owned subsidiary of Iluka Resources Limited. Mining covered an area of around 1,500 ha and operations at the site were idled in 2013. Rehabilitation activities have continued since that time (including rehabilitation earthworks, landform restoration, revegetation, infrastructure deconstruction and demolition).

In 2019, the Eneabba Phase 1 Project commenced construction under Works Approval (W6251/2019/1) and has been operating under the existing Eneabba Licence L5646/1994/10 since 2020. Phase 1 involves the recovery/mining of stored by-product material from the Eneabba Monazite Pit (EMP) and processing through a small-scale physical separation plant to produce a mineral sands concentrate (MSC) product.

In 2020, the Eneabba Phase 2 Project commenced construction of a standalone processing plant (under Works Approval W6458/2020/1) to produce a 90% Monazite product and Heavy Mineral Concentrate (HMC). The plant receives the MSC feed from the Phase 1 plant. The Phase 2 plant was commissioned in 2022.

In 2022, construction of the Eneabba Rare Earth Refinery commenced, under Works Approval W6641/2022/1, to process the 90% monazite product from EP2. Once operations commence, the Eneabba Rare Earth Refinery (ERER) will produce rare earth oxides and carbonates.

In 2024, the construction of the Eneabba Accommodation Village WWTP was completed, under Works Approval W6794/2023/1. Commissioning is expected to commence in the second half of 2024.



N

0 Meters 2,500

ENEABBA TEMPORARY CONSTRUCTION CAMP WWTP
Regional Site Layout

ILUKA

GDA 1994 MGA Zone 50

Aerail Image: Oct 2023

ORIG: B Kraft DRAWN: B Kraft SCALE (A4): 1:106,392 DATE: 29/08/2024 DWG No: 245114 V02

FIGURE: 1

3. PROPOSED WORKS

A WWTP is required to be constructed to support the Eneabba Temporary Construction Camp, which will accommodate 500 personnel and treat a maximum sewage throughput of 100 m^3/day. Figure 2 provides the general site layout of the WWTP and the location of the Eneabba Temporary Construction Camp, while Figure 3 presents the proposed Temporary Construction Camp general arrangement.

A summary of the process description, indicative key infrastructure and equipment associated with the WWTP is provided in Section 3.1.

3.1 Process Description

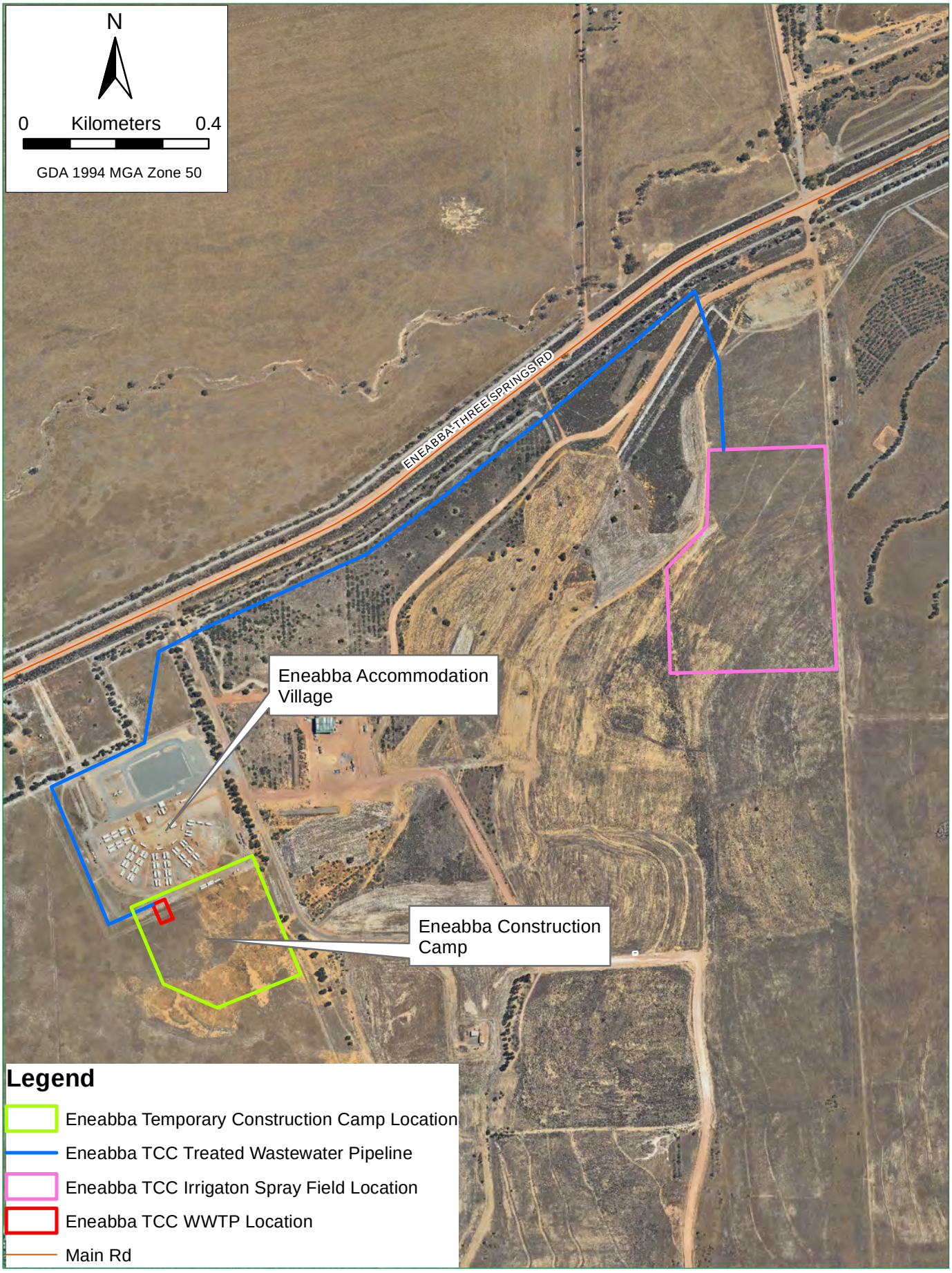
The WWTP will be designed to treat sewage/wastewater from the accommodation facility, kitchen and mess areas, operating 24 hours a day, 365 days a year. The proposed WWTP will be a containerised modular system, utilising the anaerobic-anoxic-aerobic treatment method (A2O method) designed to remove nitrogen and phosphorus from sewage/wastewater. Figure 4 provides the WWTP process design and Figure 5 provides the WWTP proposed general arrangement.

The overall system consists of the following:

- solids screen;
- primary clarifier tank;
- anaerobic tank;
- anoxic tank;
- aerobic tank;
- secondary clarifier tank; and
- irrigation spray field.

The A20 process consists of three zones in series: anaerobic, anoxic and aerobic. Each zone is further divided into several compartments. The anaerobic zone treats biological oxygen demand (BOD), chemical oxygen demand (COD) and phosphorus, anoxic treats nitrogen and small amounts of BOD and COD and aerobic treats the remaining BOD and nitrogen. Nitrified liquor is recirculated from the aerobic tank to the anoxic tank. The final effluent is disinfected prior to discharging to an irrigation spray field. The discharged effluent will be piped, using a lay on ground HDPE pipeline, to the irrigation spray field from the WWTP. Sludge produced from the treatment process will be monitored on a regular basis and removed as required by a licensed controlled waste contractor.

The proposed equipment and infrastructure is included in Table 2 and the design parameters are included in Table 3.



ENEABBA TEMPORARY CONSTRUCTION CAMP WWTP

General Site Layout

ILUKA

ORIG: [redacted] DRAWN: V.D SCALE (A4): 1:11,304 DATE: 29/08/2024 DWG No: 245183v04

FIGURE: 2

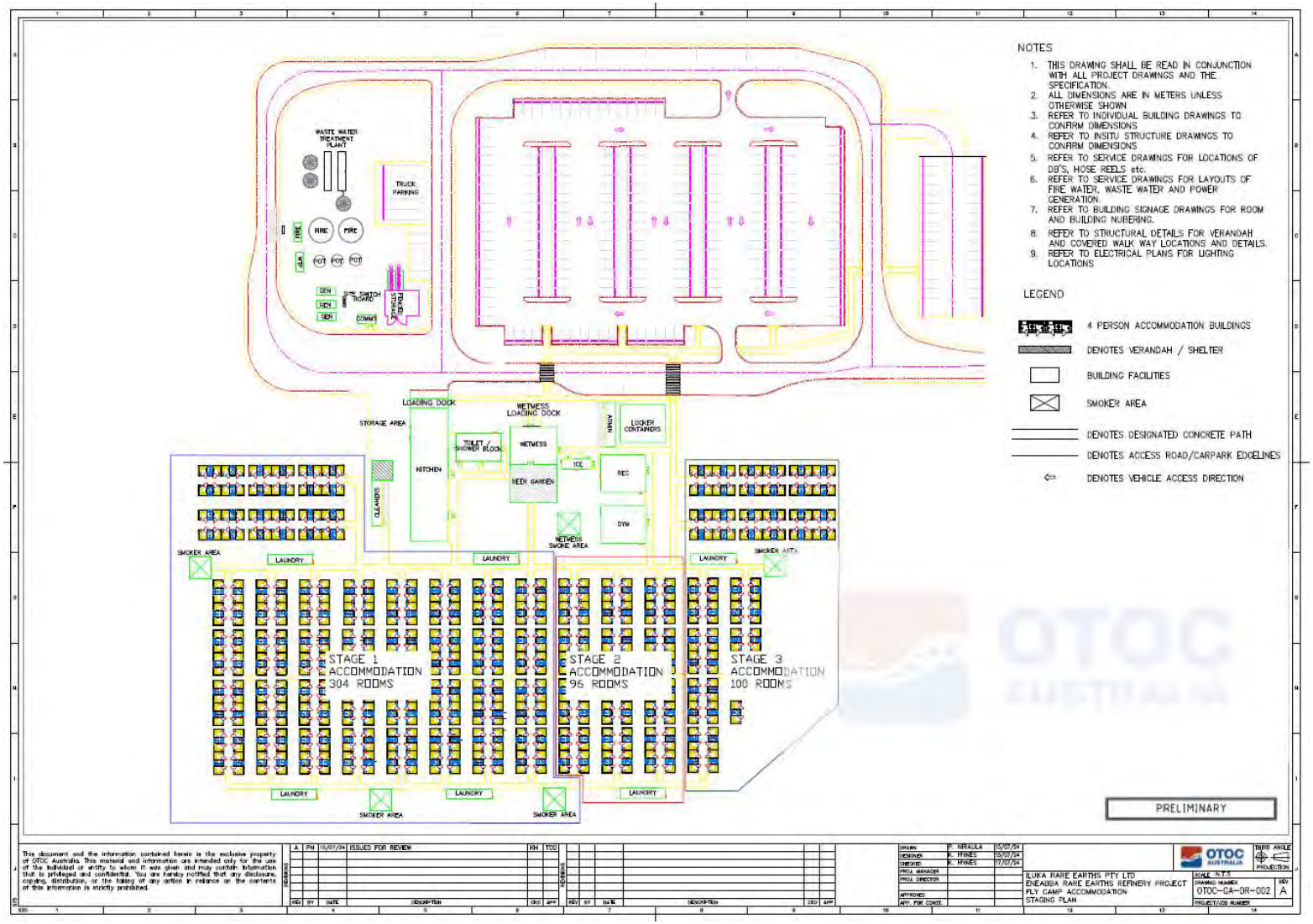


Figure 3: Eneabba Temporary Construction Camp General Arrangement

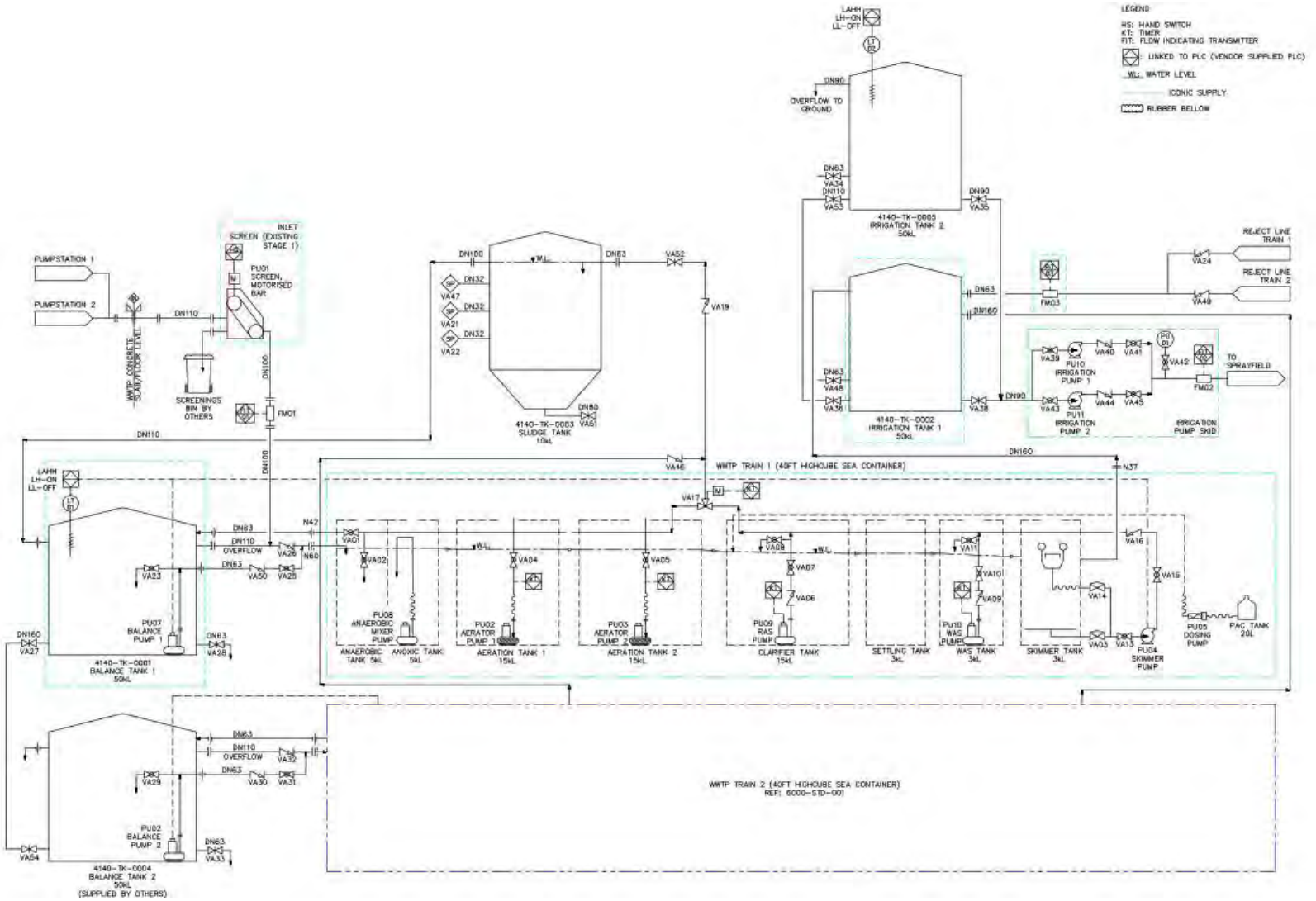


Figure 4: WWTP Process Design

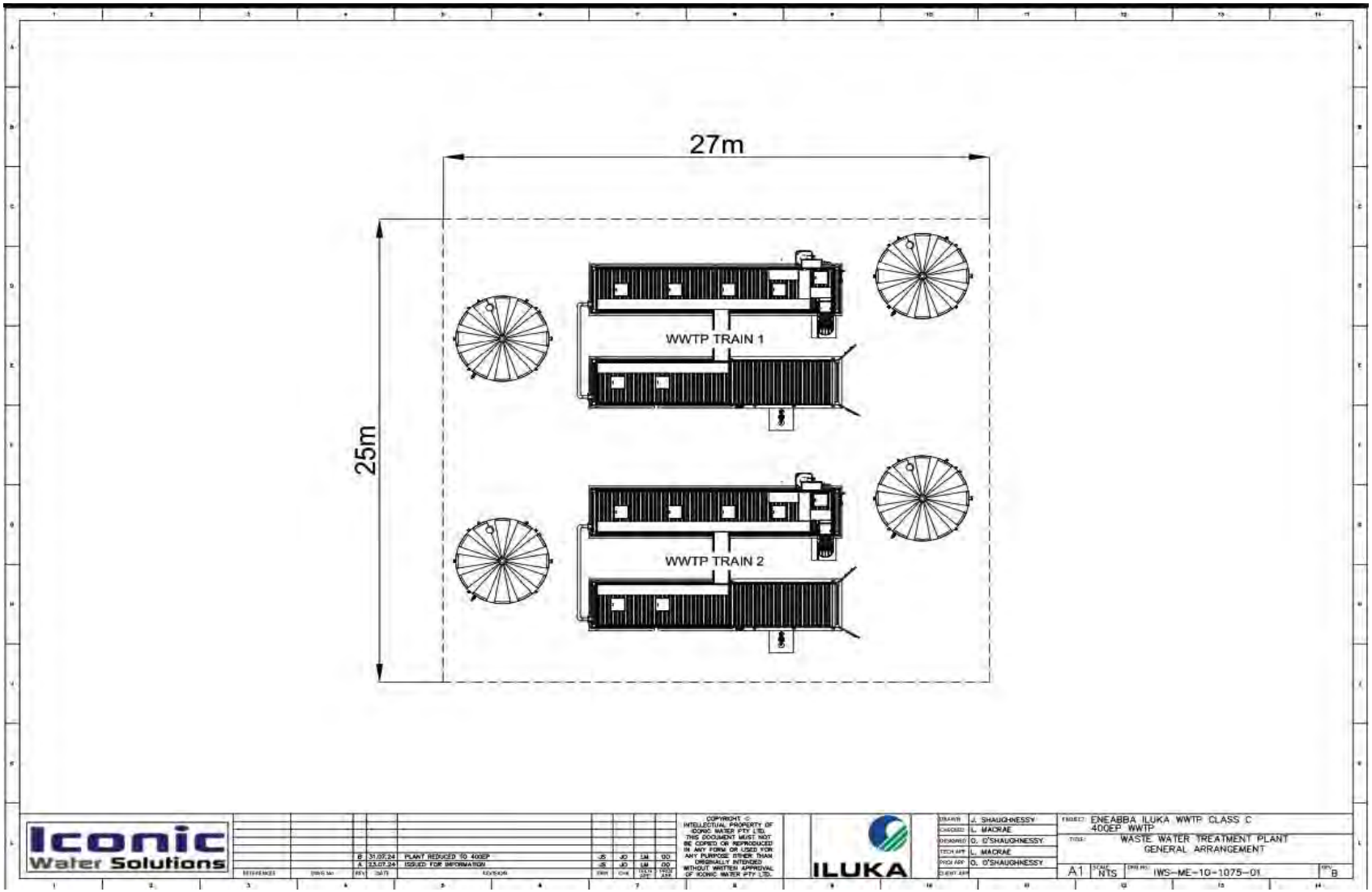


Figure 5: WWTP General Arrangement

Table 2: Summary of Proposed Key WWTP Infrastructure and Equipment

Key Infrastructure and Equipment
Inlet bar screen
Balance pump and Balance Tank (100 kL)
A2O Process
Sludge pumps
Recirculation pump with online chlorine dosing
Sodium hypochlorite dosing system
Poly aluminium chloride dosing system
Sludge storage tank (20 kL)
Irrigation Tank and outlet 2 x 50 kL
Irrigation Pumps
Discharge Flow meter
Control Panel
Audible visual alarm
Interconnecting pipework
Access ladder and high level platform
Sewage pump station
Above ground hammer cast iron type spray field sprinklers, irrigation pump (two strand wire fencing around spray field, lockable gate, safety signage, individual branch line flush valves)

Table 3: Summary of Key Design Parameters

Parameter	Design
WWTP Design	A2O containerised modular system
Estimated wastewater treatment design capacity	100 m^3/day
Total design capacity	500 person (200L/pp/day)
Irrigation spray field design size	14.6 ha

3.2 Inputs

Inputs into the WWTP include raw wastewater (influent) requiring treatment from the Eneabba Temporary Construction Camp and the chemicals required for the treatment process. The proposed WWTP is a custom engineered design which is capable of handling the peak flows and has been designed for the anticipated influent quality is detailed in Table 4.

Table 4: Anticipated Influent Quality

Parameter	Concentration
pH	6.5-8.5
Total Nitrogen (TN)	60
Total Phosphorus (TP)	12
Total Suspended Solids (TSS)	300
Biochemical Oxygen Demand (BOD)	300

The chemical inputs, which provide several functions within the treatment process, include the following:

- Sodium hydroxide dosing;
- Sodium hypochlorite dosing; and
- Poly aluminium chloride dosing.

Chemicals will be stored in impermeable bunds or be stored in self bunded tanks/containers;

3.3 Outputs

Treated effluent from the WWTP will be disposed into the designated irrigation spray field (Section 3.4.2). Up to 100 m^3 of treated effluent will be produced per day.

Sludge produced by the WWTP will be collected in the proposed 20 kL sludge storage tank and periodically removed by a suitably licensed waste carrier for offsite disposal at a licensed facility. Sludge collection, transport and disposal will be undertaken in accordance with the *Environmental Protection (Controlled Waste) Regulations 2004*.

3.3.1 Treated Effluent Quality

The proposed WWTP will treat wastewater to a low exposure risk level (ERL) in accordance with the Department of Health (DoH) Guidelines for the Non-potable Uses of Recycled Water in Western Australia (DoH 2011). Treated effluent from the WWTP will be discharged to the designated, fenced spray field for irrigation. The hydraulic application rate will be kept below 4 mm to prevent pooling. The limits are proposed for parameters at the low ERL for the treated effluent, with the irrigation area having low risk of human contact and restricted access. The parameters and monitoring to be conducted for the treated effluent are shown in Table 5.

Table 5: WWTP Treated Effluent Target Concentrations

Parameter (Unit)	Target Concentration	Proposed Monitoring Frequency	Average Period	Method
BOD (mg/L)	<20	Monthly	Spot Sample	AS/NZS 5667.10-1998 Measurement of pH and residual chlorine with a serviced and calibrated field water quality meter/equipment For all other parameters, samples will be submitted to and tested by laboratory with NATA accreditation
TSS (mg/L)	<30			
Total nitrogen (mg/L)	<30			
Total phosphorous (mg/L)	<8			
E.coli (cfu 1000mL)	<1,000			
Residual free chlorine (mg/L)	02-2.0	Daily		
pH (NA)	6.5-8.5	Daily		

3.3.2 Irrigation Spray Field

The minimum design size of the dedicated non-human contact irrigation spray field is based on the final output potential of the WWTP at full design capacity (500 persons). This includes the expected nutrient application rate and the wastewater effluent volumes of up to 100 m^3/day. The nutrient application criteria to control eutrophic risk as described in Guidelines for the Non-potable Uses of Recycled Water in Western Australia (DoH 2011) has been used to determine the minimum area required for the irrigation spray field.

The total footprint of the irrigation spray field is 15 hectares (ha) (inclusive of an overspray buffer, fence and access track), and the minimum areas required for discharge based on the total nitrogen and phosphorus are shown in Table 6. The location of the irrigation spray field was selected to maximise the separation between Village occupants, Eneabba town, Eneabba Water Reserve and the irrigation spray field (>2 km).

The indicative design of the spray field uses above ground hammer type sprinklers to discharge the treated effluent onto the ground, positioned away from drainage lines to prevent pooling. The sprinkler will be able to deliver an approximate radius of 30 m each with a nozzle appropriately sized to reduce clogging. A 5m spray drift buffer will be added to the spray field. Figure 6 provides irrigation spray field design. The spray field will have a 1,200 mm high steel wire perimeter fence, with a lockable gate and safety signage displayed on the fencing in accordance with DoH requirements.

Table 6: Irrigation Area based on Total Phosphorous (TP) and Total Nitrogen (TN) Application Criteria

Parameter	Unit	Value
Total Nitrogen		
Number of people	People	500
Hydraulic load	L/day per person	200
Total Daily Flow (500 persons x 200L/pp/day)	m^3/day	100

Parameter	Unit	Value
TN in effluent	mg/L	30
TN in effluent per year	Kg/year	1,095
Total TN allowed per year	Kg/ha/year	180*
Minimum Irrigation area required	**ha**	**7.6**
Total Phosphorous		
Number of people	People	500
Hydraulic load	L/ day per person	200
Total Daily Flow (500 persons x 200L/pp/day)	m^3/day	100
TP in effluent	mg/L	8
TP in effluent per year	Kg/year	292
Total TP allowed per year	Kg/ha/year	20*
Minimum Irrigation area required	**ha**	**14.6**

* - Guidelines for the Non-potable Uses of Recycled Water in Western Australia (DoH 2011)

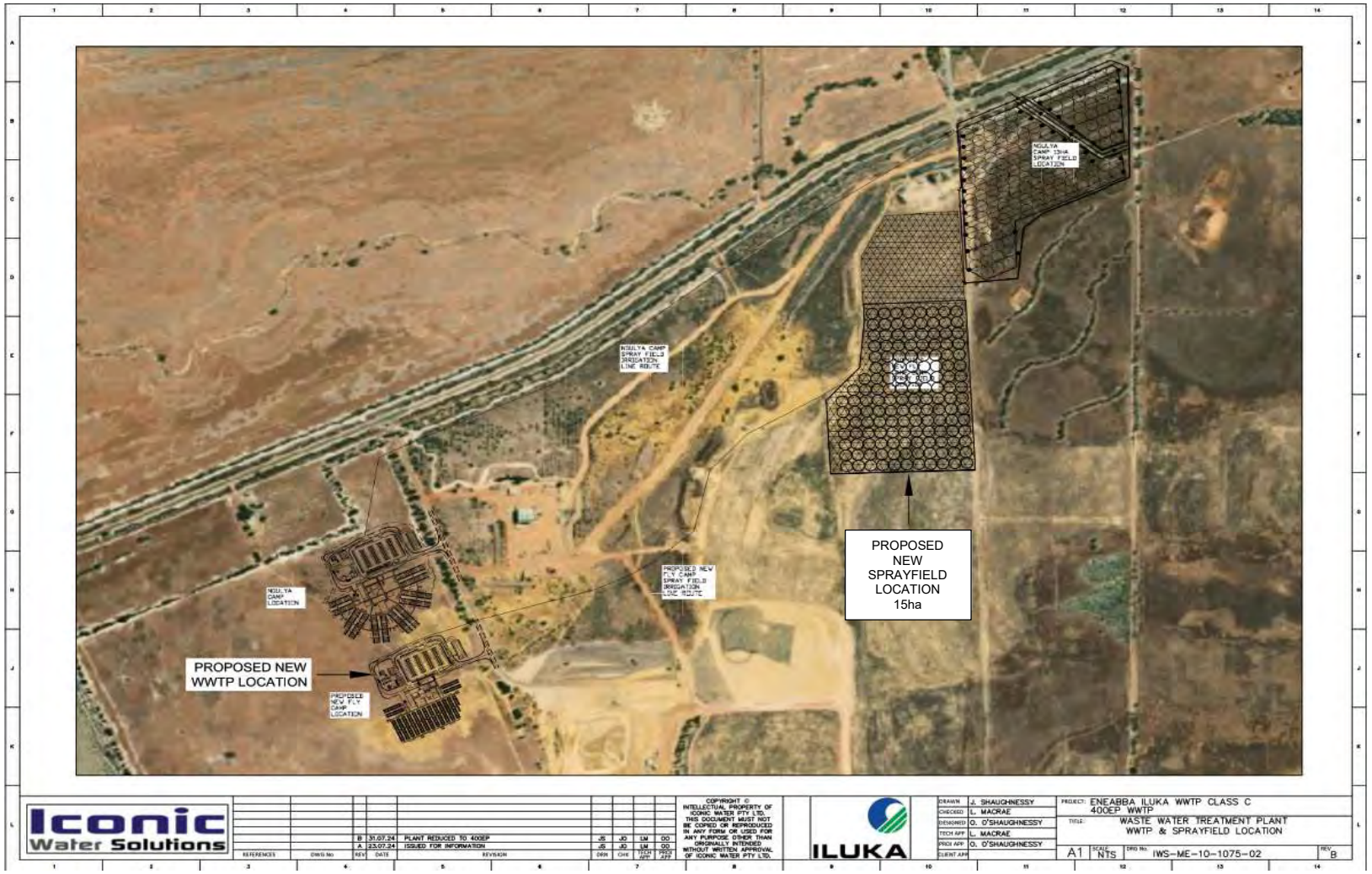


Figure 6: WWTP Irrigation Spray Field Design

4. COMMISSIONING ACTIVITIES

Subject to Iluka obtaining all necessary approvals, and the construction activities adhering to schedule, the Eneabba Temporary Construction Camp WWTP is scheduled to commence commissioning in Q3 2025. The commissioning phase is expected to be up to 3 months, 24 hrs/day, 7 days a week. Commissioning activities can be summarised as follows:

- Pre-commissioning – comprising static checks on unpowered equipment to confirm that the infrastructure has been built according to specification;
- Wet commissioning – comprising test operation of equipment and facilities with water;
- Final Commissioning – comprising test operation of equipment and facilities with chemicals and wastewater, including:
  - Material feeds to the WWTP will be gradually introduced until they reach steady state design volumes;
  - Treated effluent will be collected and recycled to the WWTP as required;
  - Validation monitoring will be conducted to ensure the WWTP is capable of treating wastewater to the required standard and confirm the WWTP is operating correctly;
  - Validation monitoring is undertaken by obtaining influent and effluent samples over the commissioning monitoring period. One compliant effluent sample, as per Table 5, is required to consider the plant successfully commissioned; and
  - Treated effluent will then be disposed to the irrigation spray field.

4.1 Time Limited Operations

Once the environmental commissioning phase concludes and the Environmental Commissioning Report has been submitted (if required) Iluka requests a phase of Time Limited Operations (TLO) of up to 180 calendar days.

Prior to the completion of this phase, Iluka will submit an amendment to the existing operating Licence (L5646/1994/10) to capture the additional operational activities of the Eneabba Temporary Construction Camp WWTP. While this amendment is being assessed by Department of Water and Environmental Regulations (DWER), Iluka requests the Eneabba Temporary Construction Camp WWTP will operate in accordance with the conditions of the TLO stipulated in the Works Approval until such time as a Licence amendment is granted.

5. LEGISLATIVE CONTEXT (APPROVALS)

5.1 *Environmental Protection Act 1986* - Part V Licence

The Eneabba mine site operates under prescribed premises Licence L5646/1994/10 issued under Part V of the EP Act. The Eneabba Temporary Construction Camp WWTP triggers prescribed premises Category 54 Sewage facility (more than 100 cubic metres per day). Iluka will submit an amendment to L5646/1994/10 to incorporate the additional category.

5.2 Mineral Sands (Eneabba) Agreement Act 1975

Approval under the *Mineral Sands (Eneabba) Agreement Act 1975* for Eneabba Camps was included in the ERER State Agreement Proposal, was received from the Minister for State Development on 6 September 2022. The construction, operation and then decommissioning and removal of a temporary camp on previously cleared Iluka-owned land is not a significant modification, expansion or variation to the existing ERER proposal previously approved by the Minister for State Development.

5.3 Contaminated Sites Act 2003

In 2007, Iluka reported a number of known or suspected contaminated sites to the DWER Contaminated Sites Branch, in accordance with obligations under the *Contaminated Sites Act 2003*. Investigations regarding the management of contaminated sites are ongoing in parallel with rehabilitation activities.

In 2017 and 2018 Iluka undertook a data gap review of contaminated sites at the Eneabba mine site. The Data Gap Analysis and Conceptual Site Model Report was submitted to DWER in March 2018. Iluka has a comprehensive contaminated sites programme that assesses and remediates legacy contaminated sites. Legacy contaminated sites located at Eneabba that have been reported to DWER are included in the contaminated sites programme for further assessment and remediation. Subsequent to the site classifications summarised above, certain source areas have been decommissioned, remediated or rehabilitated however the site classifications have not yet been updated.

5.4 Health (Miscellaneous Provision) Act 1911 and *Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974*

Approval under the *Health (Miscellaneous Provision) Act 1911 and Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974* is required for the Eneabba Temporary Construction Camp WWTP. An application to construct or install an apparatus for the treatment of sewage will be submitted to the Shire of Carnamah.

6. STAKEHOLDER CONSULTATION

6.1 Key Stakeholders

Iluka has identified key stakeholders and other stakeholders who have an interest in the Eneabba Accommodation Village. Key stakeholders are summarised as follows:

- State Government:
  - Department of Mines, Industry Resources and Safety (DMIRS).
  - DWER.
  - Department of Health (DOH).
  - Department of Jobs, Tourism, Science and Innovation (DJTSI).
  - Department of Biodiversity, Conservation and Attractions (DBCA).
  - Department of Primary Industries and Regional Development.
- Local Government:
  - Shire of Carnamah.
- Yamatji Nation, via Yamatji Southern Regional Corporation (YSRC).
- Landowners.
- Eneabba Local Community.

6.2 Stakeholder Engagement Process

Iluka has approached stakeholder engagement for Eneabba Phases 1, 2 and the ERER as a single, integrated and ongoing program since early 2019 following the conception of Phase 1. While the focus for this early engagement was Phase 1, the Phase 2 consultations introduced and discussed conceptual plans for the Eneabba Accommodation Village.

Recent and ongoing engagement focuses on the current ERER project, a summary is provided below.

6.3 Stakeholder Engagement

Throughout July 2021 and August 2022, consultation was undertaken with a range of key stakeholders and members of the Eneabba community, facilitated by Iluka's Mid-West Operations Team, corporate Communities Team and independent consultancy, 361 Degrees consultants. The engagement program built on stakeholder and community engagement undertaken by Iluka to support the state government approvals process for Iluka's Eneabba Phase 2 Project in the second half of 2020. An overview of the engagement objectives, activities and outcomes is provided below.

The following objectives were identified in guiding the engagement process:

- Build on the Eneabba Phase 2 engagement process to further develop and maintain Iluka's relationships with key stakeholders across the local and broader community.
- Proactively identify potential issues - testing, validating and amending risk assumptions with stakeholders.

- Satisfy or exceed regulators' expectations in relation to stakeholder engagement (environmental, radiation management plan and other regulatory approvals).
- Create a high level of satisfaction with the engagement process across all stakeholder groups.
- Build internal capacity to recognise that genuine and credible consultation contributes significantly to Project success, building trust and confidence, accessing fresh ideas and promoting the support necessary to minimise risk, reduce costs and meet Project timelines.
- Actively listen and monitor stakeholder feedback to understand community sentiment and their awareness and understanding of the Project, its impacts and the required approvals process, in order to tailor the responsiveness of engagement.
- Align the Project's engagement objectives with Iluka's Mid-West Social Strategy to support the organisation's broader approach to managing its social licence.

Engagement activities included:

- Internal briefings with Iluka employees across the mid-west region.
- Briefings with key stakeholders including state and local government agencies and industry associations.
- Meetings with Yamatji Southern Regional Corporation as representatives of Traditional Owners.
- Interviews with representatives of community groups and businesses from Eneabba.
- A community forum providing an open house opportunity for the Project team to meet members of the Eneabba community and present the Project.

7. LOCATION AND SITING

The Eneabba Temporary Construction Camp WTTP is located in the Shire of Carnamah approximately 1.2 km east of the town of Eneabba and 570 m south of the Eneabba / Three Springs Road. The Eneabba township has a population of about 142 (ABS 2021).

The current land uses within and adjacent to the Project Area include agriculture, mining and Eneabba townsite infrastructure. Broad-acre agriculture is the major land use in the Eneabba region which is dominated by a mix of cereal cropping and annual pastures for sheep and beef cattle. Within the wider region, there has been an increase in horticultural land use over the past decade including olive plantations, citrus and nut orchards. Other mining activities in the region include iron ore, oil, gas, lime sands, gypsum and limestone.

The Project Area does not contain conservation reserves. The closest conservation reserve is an un-named reserve located 1.3 km west of the Project Area. There are several large nature reserves, approximately 8 to 12 km west of the Project Area. These include Beekeepers Nature Reserve (R 24496), Lake Logue Nature Reserve (R 29073), Stockyard Gully Reserve (R 36419) and several unnamed Nature Reserves. To the east are Wotto Nature Reserve (R 29806), Tathra National Park (R 29805) and Alexander Morrison National Park (R 29803).

7.1 Climate

The climate and meteorological characteristics of the region control the dispersion, transformation and removal (or deposition) of pollutants from the atmosphere, and therefore ambient air quality. The region has a Mediterranean climate characterised by hot, dry summers and cool wet winters.

The long-term climate data for this region is sourced from the Bureau of Meteorology (BoM) meteorological station at the Badgingarra Research Station (BoM station ID: 009037), located approximately 60 km south of Eneabba. Between 1991 and 2020, the Badgingarra Research Station recorded mean maximum and minimum summer temperatures of 34.5°C and 14°C, respectively while mean maximum and minimum winter temperatures recorded were 18.8°C and 7.4°C, respectively (BoM, 2021a). The long-term temperature statistics are presented in Figure 7.

The region has a mean annual rainfall of approximately 538 mm as presented in Figure 8 (BoM, 2021b). Rainfall varies seasonally and there is significantly more rain during the winter months.

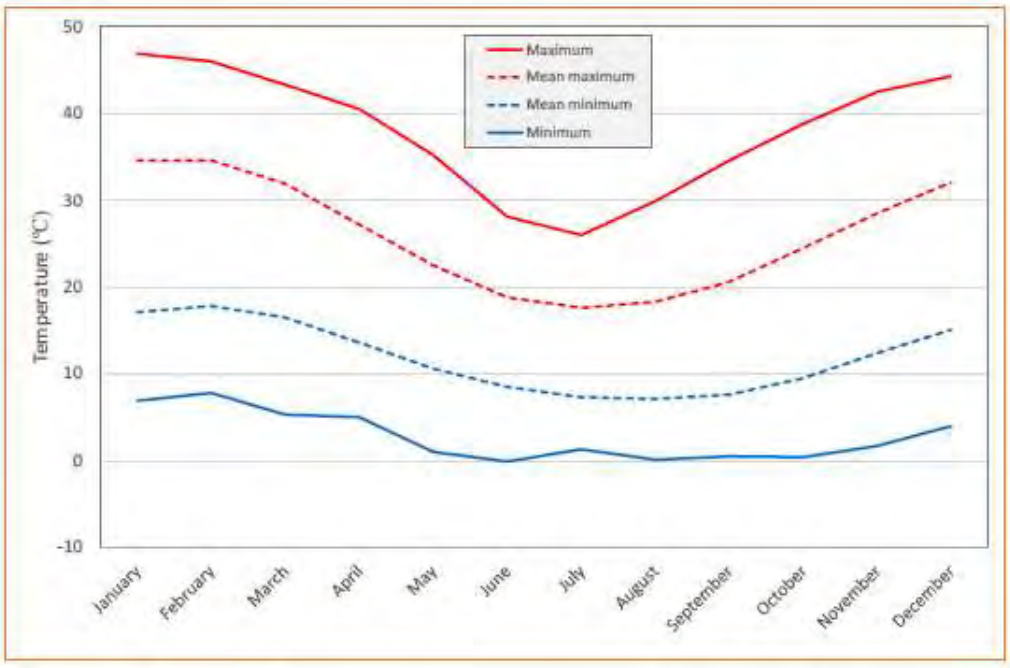


Figure 7: Long Term Temperature Statistics (BoM, 2021a)

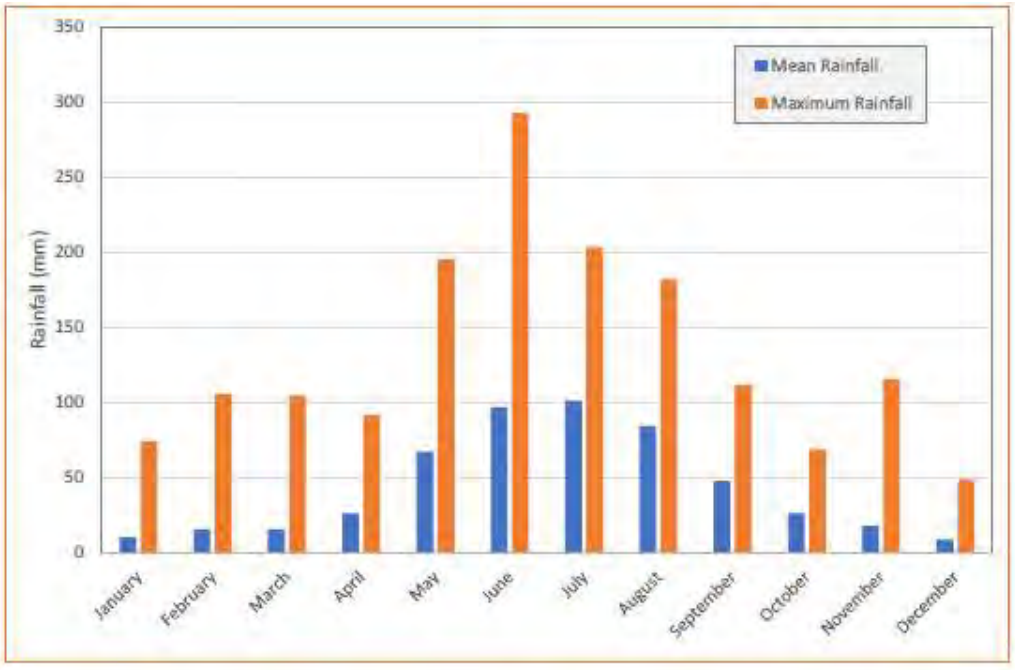


Figure 8: Long Term Rainfall Statistics (BoM, 2021b)

7.2 Residential and Sensitive Premises

The distances to residential and sensitive receptors are detailed in Table 7.

Table 7: Receptors and distance from Project Area boundary

Sensitive Land Uses	Distance from Prescribed Activity
Eneabba Town Site	1.2 km to the west
Residential premises	1.2 km to the west
Eneabba Water Reserve (Priority 1)	500 m west of the WWTP and 1.1 km west southwest of the irrigation spray field
Eneabba Water Reserve (Priority 2)	100 m west of the WWTP and 1 km west southwest of the irrigation spray field

7.3 Specified Ecosystems

As per DWER's guidance statement, environmental siting is the consideration of the surrounding environment, including areas of high conservation value and special significance (Specified Ecosystems), that could be impacted as a result of activities upon or emissions and discharges from prescribed premises (DWER 2016).

Table 8 describes the specified ecosystems within the proximity of the Eneabba Accommodation Village WWTP, taken from Guidance Statement: Environmental Siting (DWER 2016). Attachment 7 – 'Specified Ecosystems and Sensitive Land Uses' provides a map showing the Project Area in relation to the specified ecosystems and sensitive land uses.

Table 8: Nearby specified ecosystems and sensitive receptors

Type / classification	Description	Distance + direction to Project Area
Environmentally Sensitive Areas	Buffer surrounding the Threatened Ecological Community (Rocky Springs Ferricrete)	5.9 km south southwest of the WWTP and 6.8 km south southwest of the irrigation spray field.
Threatened Ecological Communities	Threatened Ecological Community (Rocky Springs Ferricrete)	10.9 km south southwest of WWTP and 11.8 km south southwest of the irrigation spray field.
Threatened and/or priority fauna	Nil	NA
Threatened and/or priority flora	Nil	NA
Aboriginal and other heritage sites [2]	NA	NA
Public drinking water source areas	Eneabba Water Reserve (Priority 1)	500 m west of the WWTP and 1.1 km west southwest of the irrigation spray field (see Figure 11).

Type / classification	Description	Distance + direction to Project Area
	Eneabba Water Reserve (Priority 2)	100 m west of the WWTP and 1 km west southwest of the irrigation spray field (see Figure 11).
Rivers, lakes, oceans, and other bodies of surface water, etc.	Eneabba Creek is located north of the WWTP and irrigation spray field.	800 m north of the WWTP and 320 m north of the irrigation spray field.
	An intermittent wetland system is located to the southwest of the WWTP and irrigation spray field with one basin (Wetland # 10 b)	7.1 km south of the WWTP and 7.9 km south southwest of the irrigation spray field.
Acid sulfate soils	NA. An acid sulfate soils survey was undertaken over the Eneabba mine site and determined that no PASS soils are likely to occur (SWC 2008).	NA
Nature Reserves	Un-named Reserve	1.3 km west of the WWTP and 2.3 km west of the irrigation spray field.
	South Eneabba Nature Reserve (which is within the State Agreement Lease and contains an area which was previously mined).	7 km south southwest of the WWTP and 8.4 km south southwest of the irrigation spray field.

7.4 Geology and Soils

The Eneabba mineral sands deposits are located on the north western extremities of the Swan Coastal Plain, to the west of the Gingin Scarp and the Dandaragan Plateau. The mineral sand deposits primarily occur in unconsolidated Quaternary coastal sediments and alluvium west of the Gingin Scarp, in an area referred to as the Eneabba Plain. Aeolian dunal depositions of white or yellow sands occur over part of the area (OES 2008).

Undisturbed soils at Eneabba typically comprise an upper profile of sands and gravelly sandy clays at depth. The undisturbed sands include surface 'topsoil' sands with organic matter accumulation, grading down to yellow or pale, bleached sands. Gravelly sandy clays are present in gradational, duplex profiles containing 20 to 30% gravel (OES 2008).

Soil Water Consultants (SWC) undertook an acid sulfate soils (ASS) survey in 2008 over the Eneabba Operations to identify whether there are any potentially acid sulfate soils (PASS). The assessment included a desktop study and broad scale drilling and sampling of areas where PASS may occur.

The soils consist of deep surficial sands to sandy clays overlying the Yarragadee Formation. The surficial soils are well oxidised and freely draining. The pedogenic and redoximorphic conditions are unsuitable for the formation or hosting of PASS, and therefore, no PASS is likely to occur. In areas immediately to the east of the Warradarge Fault, groundwater occurs in the basal portion of the surficial sediments creating a reducing environment. Although reducing conditions exist in this area, no PASS were identified during broad scale drilling and soil sampling (i.e. pH results typically >4) (SWC 2008).

The assessment determined that no PASS soils are likely to occur within the Eneabba mine site (SWC 2008).

7.5 Surface Water

The Project Area falls within the Logue Surface Water Catchment, which is served by watercourses that originate on the Dandaragan Plateau and Arrowsmith Region and drain into large swamps or lakes in interdunal depressions on the Swan Coastal Plain. The surface drainage pattern is towards the west reflecting the general slope of the landscape of the sedimentary basin.

Surface water flows are generally considered to be low in the Eneabba region due to the predominantly sandy nature of the surface soils and their corresponding high infiltration rates (SWC 2009). These sandy soils are associated with the Eneabba Plain, which consists of deep sands (up to 40 m deep) overlying the Yarragadee Formation. Eneabba Creek is located to the north of the Project Area, on the northern side of Eneabba Three Spring Road. The Eneabba Accommodation Village WWTP and irrigation spray field is located on a flat agricultural land, with very little surface flow expected.

7.6 Hydrogeology

The Project Area is located within the northern part of the Perth Basin. Groundwater occurs in the Yarragadee Formation, which is approximately 2,500 m thick and comprises sandstone with siltstone, claystone and shale. The Yarragadee Formation is overlain by a veneer of superficial deposits comprising sand, silt, clay and laterite. Groundwater in the superficial deposits is in hydraulic connection with groundwater in the underlying Yarragadee Formation. The Warradarge Fault is believed to subcrop beneath the superficial deposits along an approximately north northwest trend west of the Brand Highway. The Yarragadee Formation to the east and the Cattamarra Coal Measures (sandstone, siltstone, shale and coal measures) to the west of the fault (where the Yarragadee Formation is not present), are juxtaposed laterally across the fault. Figure 9 shows the hydrogeological cross-section some 20 km north of Eneabba.

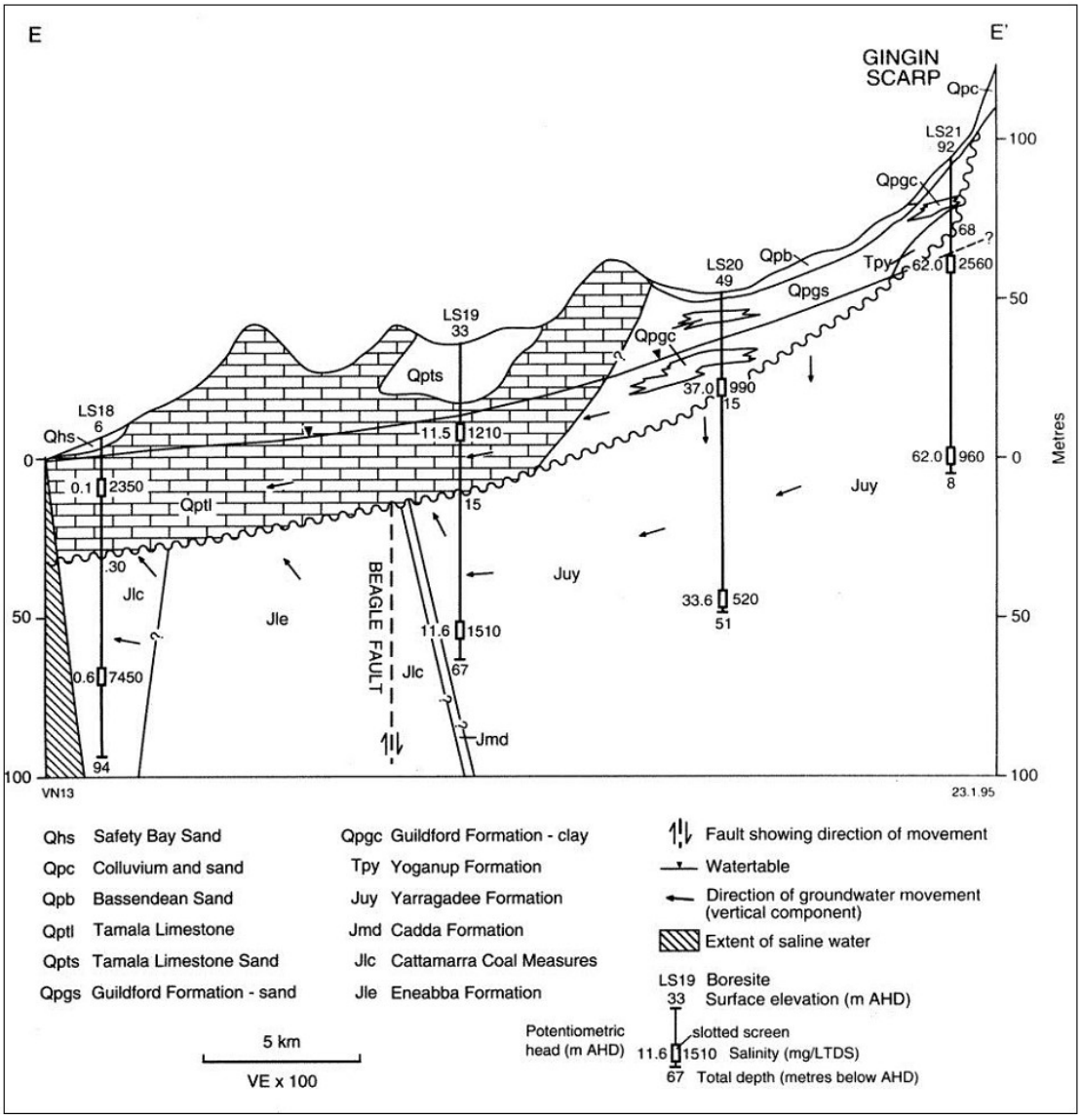


Figure 9: Hydrogeological Cross-Section 20km North of Eneabba

The aquifer is informally divided into two zones, a 'shallow' aquifer comprising superficial deposits and the Yarragadee Formation to a depth of 210 m and a 'deep' aquifer comprising the Yarragadee Formation greater than 210 m depth. The regional depth to watertable (Figure 10) within the Project Area is between 10 to 40 m. The superficial formations are shown to be unsaturated with flow predominantly east to west, from the elevated areas along the Gingin Scarp towards the coast. The watertable is highest adjacent to the Gingin Scarp, where it is up to 90 m AHD near Eneabba and declines westward to the coast (DOW, 2017).

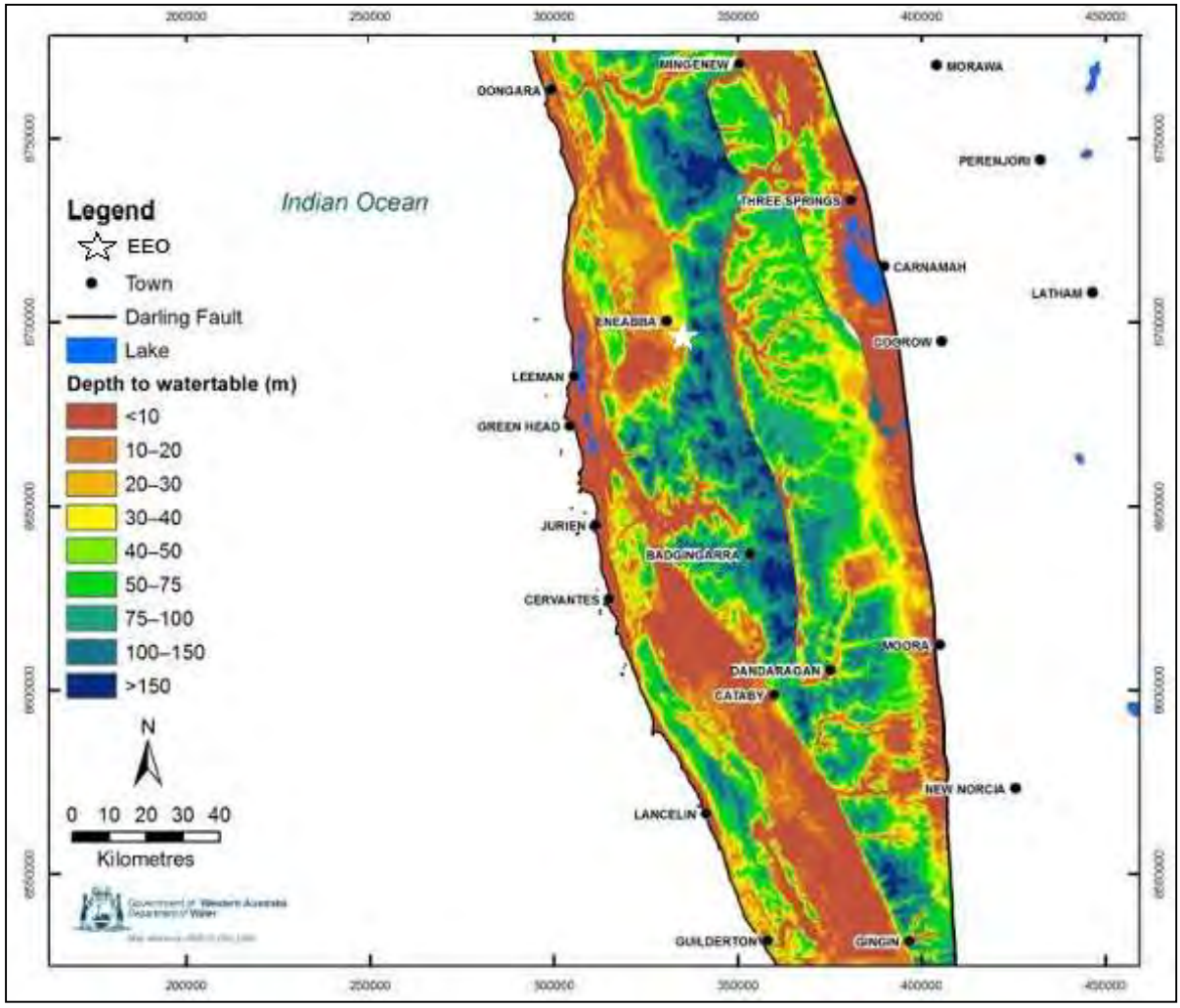


Figure 10: Regional Depth to Groundwater Table (DOW 2017)

Groundwater recharge to the unconfined and shallow water-bearing zones of the lower Yarragadee Formation occurs from rainfall and surface runoff infiltration where it outcrops (east of the Gingin Scarp) as well as through the overlying unsaturated superficial sediments. Groundwater beneath the site would also be expected to be recharged by regional flow. Locally, groundwater was also recharged during previous operations from water storage dams and storage of sand and clay tailings.

There is considerable variability in hydraulic properties through the Yarragadee aquifer, depending on the proportions of sand and clay, and, in deeper parts of the aquifer, the degree of diagenesis. The permeability of sandstone beds tends to decrease with depth due to an increasing clay matrix and cementation of the sandstone (DOW, 2017).

Groundwater flow beneath the mine site in the lower Yarragadee Formation aquifer is considered to be broadly in a north westerly direction. The Warradarge Fault behaves as a partial hydraulic barrier to westerly flows towards the coast which results in groundwater flows in a north westerly direction prior to flowing in a westerly direction beyond the northern extent of the Warradarge Fault.

7.6.1 Background Water Quality and Environmental Values

Groundwater resources can support environmental values such as ecosystems (i.e. groundwater dependent ecosystems (GDEs)), amenity, cultural values, recreation, public drinking water supplies and agricultural and industry use of water. Protection of these values and uses relies on an understanding of the groundwater resource and its existing (i.e. background) water quality and quantity.

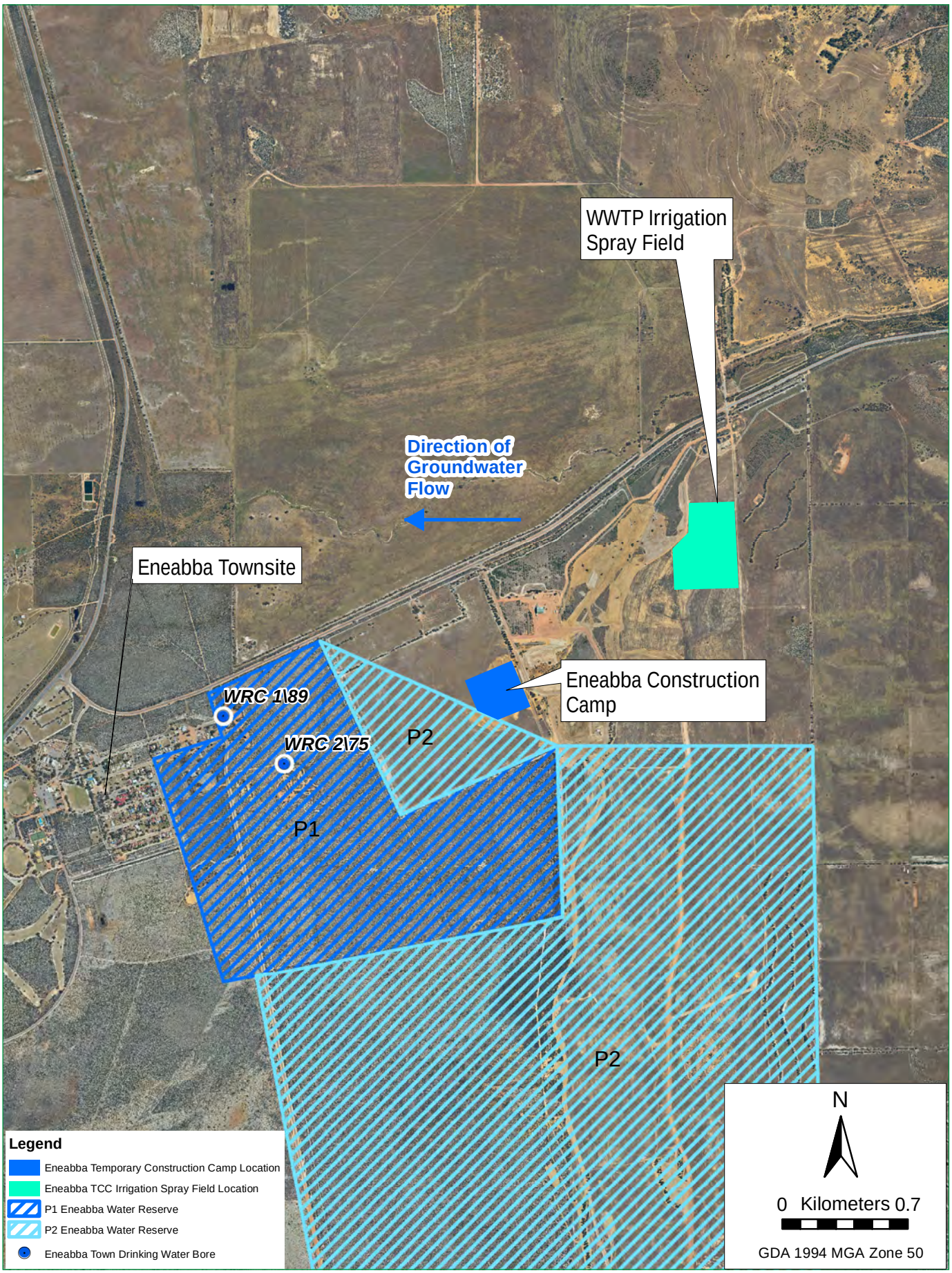
Relevant guidelines should be referenced depending on environmental values in vicinity of the Project, including the:

- Australian Drinking Water Guidelines (NHMRC, 2018) – for use where activities occur within or in proximity to groundwater used for drinking water supplies.
- Water Quality Guidelines for the Protection of Aquatic Ecosystems (ANZECC and ARMCANZ, 2000) – for general use in relation to the protection of aquatic ecosystem health and beneficial uses.
- Various water quality protection guidelines and notes available at DoW (www.water.wa.gov.au).

The background water quality at the Project Area, based on local groundwater monitoring, is considered to be of “poor quality” with salinity levels of 1,000 mg/L TDS, based on Australia Drinking Water Quality Guidelines (NHMRC, 2018).

The Eneabba town water supply (Priority 1 and 2 Eneabba Water Reserve) uses the regional aquifer (Yarragadee aquifer), and the current point of abstraction is located approximately 1.1 km west of the WWTP and approximately 2.3 km west-southwest of the irrigation spray field (Figure 11).

Agricultural use is a potential groundwater use within the Project Area, as the salinity of the groundwater is such that it could be used for both stock and irrigation.



ENEABBA TEMPORARY CONSTRUCTION CAMP WWTP

Location of the WWTP and Irrigation Spray Field in Relation to the Eneabba Water Reserves

ILUKA

ORIG: B.Kraft DRAWN: V.D SCALE (A4): 1:29,090 DATE: 29/08/2024 DWG No: 245182v02

FIGURE: 11

7.7 Flora and Vegetation

A number of flora and vegetation surveys have been conducted in the Eneabba region over the course of the mining operations. These include baseline surveys of the vegetation community types within the Eneabba operations and surrounding regions, as well as targeted surveys to identify conservation significant flora within Iluka's mining operations.

The Eneabba Temporary Construction Camp WWTP and the irrigation spray field are located on existing agricultural land, which has been recently used for sheep grazing. No clearing of native vegetation will be required for the construction of the WWTP or irrigation spray field.

8. RISK MITIGATION AND MANAGEMENT

A risk assessment has been prepared to identify the potential emissions from the proposed activities and the potential sources, pathways and receptors of those emissions. The risk assessment provides the proposed controls to manage these potential emissions and determine the residual risk ranking. The risk framework and rating matrix is taken from DWER's *Guidance Statement: Risk Assessments* (DWER 2017).

8.1 Risk Assessment Method

In determining the likelihood and consequence of a risk event occurring, the criteria outlined in Table 9 and Table 10 has been used (DWER 2017). In determining the rating of a risk – the consequence is assessed together with the likelihood (i.e. **consequence x likelihood = risk**), as per the Risk Rating Matrix in Table 11.

Table 9: Likelihood Rating Matrix

Likelihood	Likelihood Description
Almost Certain	The risk event is expected to occur in most circumstances.
Likely	The risk event will probably occur in most circumstances.
Possible	The risk event could occur at some time.
Unlikely	The risk event will probably not occur in most circumstances.
Rare	The risk event may only occur in exceptional circumstances.

Table 10: Consequence Rating Matrix

Consequence	Consequence Description	
	Environment	**Health and Amenity**
Severe	• **on-site impacts**: catastrophic • **off-site impacts local scale**: high level or above • **off-site impacts wider scale**: mid-level or above • Mid to long term or permanent impact to an area of high conservation value or special significance	• Loss of life • **Adverse health effects**: high level or ongoing medical treatment • **Local scale impacts**: permanent loss of amenity
Major	• **on-site impacts:** high-level • **off-site impacts local scale:** mid-level • **off-site impacts wider scale:** low-level • Short term impact to an area of high conservation value or special significance	• **Adverse health effects:** mid-level or frequent medical treatment • **Local scale impacts:** high-level impact to amenity
Moderate	• **on-site impacts:** mid-level • **off-site impacts local scale:** low-level • **off-site impacts wider scale:** minimal	• **Adverse health effects**: low-level or occasional medical treatment • **Local scale impacts**: mid-level impact to amenity
Minor	• **on-site impacts**: low-level • **off-site impacts local scale**: minimal • **off-site impacts wider scale**: not detectable	• **Local scale impacts:** low-level impact to amenity
Slight	**on-site impact: minimal**	**Local scale: minimal impacts to amenity**

Table 11: Risk Rating Matrix

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

8.2 Risk Assessment

The potential emissions, sources, pathways and receptors identified for the construction, commissioning and time-limited operation of the Eneabba Temporary Construction Camp WWTP are outlined in Table 12. The risk assessment demonstrates that there are no potential material residual environmental impacts associated with the proposed activities of the Eneabba Temporary Construction Camp WWTP.

Environmental management controls have been proposed to mitigate any potential risks and their impacts. The monitoring techniques to determine the effectiveness of the controls are detailed within Section 10.

Table 12: Risk Assessment

Source/ Activities	Potential Emissions	Potential Pathway and Impact	Potential Receptor	Proposed Controls	Consequence Rating	Likelihood Rating	Risk Rating	Reasoning and Management	Regulatory Control
Construction - Earthworks and construction activities during the construction phase of the WWTP									
Vehicle movements on unsealed access roads Earthworks for WWTP pad and associated infrastructure installation of WWTP	Dust	Air/ wind dispersion. Health and amenity impacts Dust impacts on surrounding vegetation due to smothering	Nearest receptor are Eneabba town site, residential premises	**Management Control** - Any earthworks required during construction will be restricted to only areas required for construction activities - Vehicles and earth moving equipment will keep to defined roads - Dust suppression (water sprays, water trucks, control of vehicle movements/ restricted speeds) will be employed during construction if required **Proposed Monitoring** - Opportunistic inspections for dust emissions during mobilisation, installation/construction - An incident reporting system will be maintained to assist in managing environmental incidents such as excessive dust emissions	Slight	Unlikely	**Low**	-Dust emissions during installation/assembly will be very minimal -Due to the location of the premises in a remote pastoral area, with no residences in the immediate vicinity (the nearest receptor is 1km west – Eneabba residential premises) and the short assembly timeframe, like likelihood of this event is reduced	Part V current Licence L5646/1994/10 Eneabba Dust Management Plan (Iluka, 2018)
Unloading, moving and assembling WWTP infrastructure, and reversing vehicle alarms	Noise	Air/ windborne. Health and amenity impacts	Nearest receptors are Eneabba town site, residential premises	**Management Controls** - Noise emissions will comply with the *Environmental Protection (Noise) Regulations 1997* - Construction works will be carried out in accordance with Australian Standard AS2436-1981 "Guide to Noise Control on Construction, Maintenance and Demolition Sites" - Equipment and vehicles will be maintained to ensure they are operating efficiently and within manufacturer's requirements **Proposed Monitoring** - An incident reporting system will be maintained to assist in managing environmental incidents such as excessive noise emissions	Slight	Rare	**Low**	- Noise emissions during installation/assembly will be very minimal - Noise emissions associated with this will be localised to the work area, no residences in the immediate vicinity the nearest receptor is 1.2 km west (Eneabba residential premises)	*Environmental Protection (Noise) Regulations 1997*
Contaminated runoff (including sediment) from hardstand surfaces, bunds, drainage channels and infrastructure (roads)	Increased stormwater runoff from hardstand areas	Soil contamination and impact to vegetation	Natural catchments within the site	**Management Controls** - Liquid chemicals, including hydrocarbons will be stored in designated areas and on self-bunded facilities. - Design of drainage infrastructure based on modelling will maintain offsite natural surface water flows as much as possible. - Stormwater will be diverted from active areas to natural downstream drainage in a way that prevents increased rates of sedimentation and erosion.	Minor	Rare	**Low**	Risk pathway is low	

Source/ Activities	Potential Emissions	Potential Pathway and Impact	Potential Receptor	Proposed Controls	Consequence Rating	Likelihood Rating	Risk Rating	Reasoning and Management	Regulatory Control
Use and storage of hydrocarbons during construction and unloading of treatment chemicals for WWTP	Unauthorised discharges	Discharge to land/soil Discharge to drainage lines from overland flow Infiltration to groundwater Soil contamination impacting vegetation and health impacts to fauna	Local soils and native vegetation in the local area, surface water drainage and vegetation adjacent to the areas of spill or unauthorised discharge Local groundwater	**Management Controls** - Operate in accordance with the *Dangerous Goods Safety Act 2004* and fuel storage and handling will be in accordance with Australian Standards (AS 1940) - Refuelling restricted to dedicated refuelling areas - Spill kits will be located at all hydrocarbons and chemical storage on site to ensure immediate clean-up of any spills - Soil contaminated by hydrocarbons will either be treated in-situ or removed by a controlled waste contractor for disposal office to an appropriate licensed facility - Potentially contaminated waters retained within the work front via culverts, levees and surface diversion **Proposed Monitoring** - Regular inspections of fuel and chemical storage areas - Spillages occurring as a result of incident or equipment failures will be addressed and reported through the Iluka Incident Reporting Procedure	Slight	Possible	**Low**	-Fuel, oil and chemical spills associated with the assembly/installation of the WWTP are expected to be minor and seldom events. Impacts from such spills are expected to be localised and restricted to soils within the premises, and the nearest receptor is located 1 km to the west. - Groundwater is expected to be approximately 20-50m below ground level and given the proposed controls, vertical migration of any potential contaminants to groundwater is considered low	*Dangerous Goods Safety Act 2004* *AS 1940* *Contaminated Sites Act 2003*
Generation of waste	Solid waste/ liquid	Discharge to land from inappropriate disposal, windblown litter Amenity impacts/ adverse impacts to local fauna, soils and surface water	Local soils and native vegetation and fauna in the local area, surface water drainage and vegetation adjacent to the areas of spill or unauthorised discharge Local groundwater	**Management Control** - Maintain good housekeeping practices and store waste in dedicated waste receptacles - Manage waste in accordance with the Eneabba Waste Management Plan	Slight	Rare	**Low**	-Waste generated during installation/ construction of the WWTP and irrigation spray field will be minimal as the WWTP is modulated and will arrive on site partially assembled - If there is a breach of procedures and inappropriate storage or disposal of waste occurs, it is expected to be localised and restricted to soils within the Prescribed Premises Boundary.	Eneabba Waste Management Plan
Operations (including time-limited operations and environmental commissioning)									
Treatment of sewage	Odour	Air/ wind dispersion. Health and amenity impacts	Nearest receptors are Eneabba town site, residential premises and the campgrounds	**Management Controls** -The WWTP will be commissioned and operated in accordance with manufacturers specifications. - The irrigation spray field will be commissioned and operated in accordance with manufacturers specifications -the irrigation spray field is located 1.2 km to the east of the Eneabba Town and Eneabba Accommodation Village - The irrigations spray field will be fenced, sign posted and includes a spray drift buffer - Treated effluent generated during the commissioning process will not be discharged into the environment until it meets the relevant water quality discharge criteria **Proposed Monitoring** - Regular checks for any odour outside of the WWTP, if odours are noted necessary repairs will be made to the WWTP - Volume of sludge produced from the treatment process will be monitored on a regular basis and removed as required by a licensed controlled waste contractor. The controlled waste will be disposed to appropriate licensed landfill facility - An incident reporting system will be maintained to assist in managing environmental incidents such as odour complaints	Slight	Rare	**Low**	-The presence of odour emissions is not expected as a result of operating the WWTP, given the distance to the nearest receptors from both the WWTP (1.2 km west of residential premises) and the irrigation spray field (3 km west- southwest of residential premises) - Negligible impacts are anticipated to occur as a result of unplanned odour emissions	

Source/ Activities	Potential Emissions	Potential Pathway and Impact	Potential Receptor	Proposed Controls	Consequence Rating	Likelihood Rating	Risk Rating	Reasoning and Management	Regulatory Control
	Noise	Air/ windborne. Health and amenity impacts	Nearest receptors are Eneabba town site, residential premises and the campgrounds	**Management Controls** - Noise emissions will comply with the *Environmental Protection (Noise) Regulations 1997* - WWTP components will be regularly serviced and maintained in accordance with manufacturer's specifications -The WWTP unit will be enclosed in order to attenuate noise **Proposed Monitoring** - An incident reporting system will be maintained to assist in managing environmental incidents such as excessive noise emissions/complaints	Slight	Rare	**Low**	Due to remoteness of the Eneabba WWTP and with controls in place there is negligible risk of public impact from noise due to the operation of the WWTP	*Environmental Protection (Noise) Regulations 1997*
Sewage holding tanks and pipelines	Rupture of pipes/ overtopping of holding tanks resulting in raw sewage discharge to land	Discharge to land/soil Discharge to drainage lines from overland flow Infiltration to groundwater Soil contamination impacting vegetation and health impacts to fauna Contamination of surface water from lateral flow into drainage lines Human (worker) contact	Local soils, native vegetation and native fauna in the local area, surface water drainage and vegetation adjacent to the areas of spill or unauthorised discharge Local groundwater Eneabba Water Reserve ~100 m west of WWTP and 1 km west-southwest of irrigation spray field.	**Management Controls** - Components of the WWTP will be fitted with alarms to warn of high-water levels in the tank or if pump failure occurs. The units can be isolated and shut down if required - All storage components will be impermeable - Appropriate management of surface water flows within and around the Eneabba Accommodation Village will be implemented as required will reduce potential for contaminants to enter surface water - Spill kits will be made available at the chemical storage locations and employees trained in their use - Maintain good housekeeping practises - The sludge will be removed periodically from the sludge tank by a licensed carrier and taken offsite for disposal to an appropriately licensed facility in accordance with the *Environmental Protection (Controlled Waste) Regulations 2004* **Proposed Monitoring** - Components of the WWTP will be regularly inspected, and discharge suspended if it is discovered operating below the established standard - Spillages occurring as a result of incident or equipment failures will be addressed and reported through Iluka's incident reporting procedure	Slight	Possible	**Low**	- With controls in place, sewage spills associated with the operation of the WWTP are expected to be minor and seldom events. Impacts from such spills are expected to be localised and restricted to soils within the premises. - No permanent major drainage lines located within the vicinity of the WWTP. Therefore, there is low risk of wastewater reaching any watercourses	*Environmental Protection (Controlled Waste) Regulations 2004*
Irrigation of treated effluent that does not meet discharge quality criteria	Breach of discharge water quality	Discharge to land/soil Discharge to drainage lines from overland flow Infiltration to groundwater Soil contamination impacting vegetation and health impacts to fauna. Contamination of surface water from lateral flow into drainage lines Human (worker) contact	Eutrophication local soils and native vegetation in the local area, surface water drainage and vegetation adjacent to the irrigation spray field Local groundwater Eneabba Water Reserve ~100 m west of WWTP and 1 km west-southwest of irrigation spray field.	**Management Controls** - Operate WWTP in accordance with manufacturers specifications - WWTP balance tank will have contingency storage capacity for up to 1 day of normal flow via internal overflow system - Suitable storage will be maintained in the treated wastewater tank in case irrigation cannot occur for several days - Irrigation will not occur during significant rainfall events to prevent potential unauthorised discharge to surface water flows - Effluent is disposed of to a dedicated irrigation field by an automated system that is managed by a trained operator. The trained operator will be responsible for the disposal of effluent to the conditions present - The irrigation spray field is located over 1 km from the Eneabba Water Reserve **Proposed Monitoring** - Components of the WWTP will be regularly inspected, and discharge suspended if it is discovered operating below the established standard - Regular monitoring of the WWTP irrigation water prior to discharge to ensure discharge compliance	Slight	Possible	**Low**	-With controls in place, discharge is expected to meet effluent discharge criteria, event where discharge criteria so exceeded is not expected to occur frequently. Impacts from such events are expected to be localised and restricted to soils within the Prescribed Premises - Given the large separation distance to the Eneabba Water Reserve and the depth to groundwater is >20 m, impacts the Eneabba Water Reserve from the irrigation spray field is considered unlikely. - No permanent major drainage lines located within the vicinity of the WWTP or irrigation spray field. Therefore, there is a low risk of wastewater reaching any watercourse	

Source/ Activities	Potential Emissions	Potential Pathway and Impact	Potential Receptor	Proposed Controls	Consequence Rating	Likelihood Rating	Risk Rating	Reasoning and Management	Regulatory Control
Storage of chemicals/reagents	Unauthorised discharge/ breach of containment causing chemical discharge to land	Discharge to land/soil. Discharge to drainage lines from overland flow Infiltration to groundwater Soil contamination inhibiting vegetation growth and survival, and health impacts to fauna	Local soils and native vegetation in the local area, surface water drainage and vegetation adjacent to the areas of spill or unauthorised discharge Local groundwater Eneabba Water Reserve ~100 m west of WWTP and 1 km west-southwest of irrigation spray field.	**Management Controls** - Operate in accordance with the *Dangerous Goods Safety Act 2004* and Fuel Storage and handling will be in accordance with Australian Standards (AS 1940). Chemicals stored in accordance with relevant Australian Standards - Chemical/ reagents will be stored in impermeable bunds or to be stored in self bunded tanks/ containers - Spill kits will be made available at the chemical storage locations and employees trained in their use **Proposed Monitoring** - Regular inspections of chemical/reagent storage area - Spill kits will be checked on a regular basis and maintained in good order - Spillages of hydrocarbons occurring as a result of incident or equipment failures will be addressed and reported through the Iluka incident reporting procedure	Slight	Possible	**Low**	With controls in place (concrete bunding of storage areas), chemical/regent spills associated with the operation of the WWTP are expected to be minor and seldom events. Impacts from such spills are expected to be localised and restricted to soils within the premise. - No permanent major drainage lines located within the vicinity of the WWTP. Therefore, there is a low risk of contaminants reaching any watercourses.	*Dangerous Goods Safety Act 2004* *AS 1940*
Generation of waste	Solid waste/liquid	Discharge to land from inappropriate disposal and storage Amenity impacts/ adverse impacts to local fauna, soils	Local soils and native vegetation and fauna in the local area, surface water drainage and vegetation adjacent to the areas of spill or unauthorised discharge Local Groundwater	**Management Controls** - Maintain good housekeeping practices and store waste in dedicated waste receptacles - Manage waste in accordance with the Eneabba Waste Management Plan	Slight	Rare	**Low**	Waste generated form the WWTP during commissioning, TLO and operations will be minimal. If there is a breach of procedures and inappropriate storage or disposal of waste occurs, it is expected to be localised and restricted to soils within the Prescribed Premises area.	

9. EMISSIONS MANAGEMENT AND CONTROLS

Iluka operates under a Health, Safety, Environment and Community (HSEC) Policy and framework which includes standards, procedures, and plans to ensure appropriate environmental controls are developed for identified environmental risks, regulatory compliance is maintained and continuous improvement is achieved through regular review. Subject to approval, the construction, commissioning and operation of the Eneabba Temporary Construction Camp WWTP will be in accordance with the requirements of Iluka's HSEC Policy and the conditions of the proposed Works Approval and subsequent Licence L5646/1994/10 (as amended).

Section 8.2 (Table 12) outlines in detail the proposed management and control measures for the emissions and environmental risks identified in the Risk Assessment.

10. MONITORING

Monitoring is required to enable an assessment of the effectiveness of controls and to inform whether any improvements are required.

10.1 Discharge to Land

Monitoring of the discharge to the irrigation spray field will be undertaken as per Table 13.

Table 13: Proposed Treated Effluent Monitoring

Discharge Point	Monitoring Locations	Parameter (Unit)	Proposed Frequency	Average Period	Method
WWTP irrigation spray field depicted in Figure 2	Sampling tap prior to discharge to irrigation spray field	Treated effluent flow volume to spray field (m^3/day)	Continuous	24 hours	
		5 day biochemical oxygen demand (BOD) (mg/L)	Monthly	Spot sample	AS/NZS 5667.10-1998 Measurement of pH and residual chlorine with a serviced and calibrated field water quality meter/equipment For all other parameters, samples will be submitted to and tested by laboratory with NATA accreditation
		Total suspended solids (TSS) (mg/L)			
		Total nitrogen (mg/L)			
		Total phosphorus (mg/L)			
		Total dissolved solids (TDS) (mg/L)			
		E.coli (cfu 100mL)			
		Residual free chlorine (mg/L)	Daily (continuous)		
		pH (NA)	Daily (continuous)		

10.2 Other Monitoring

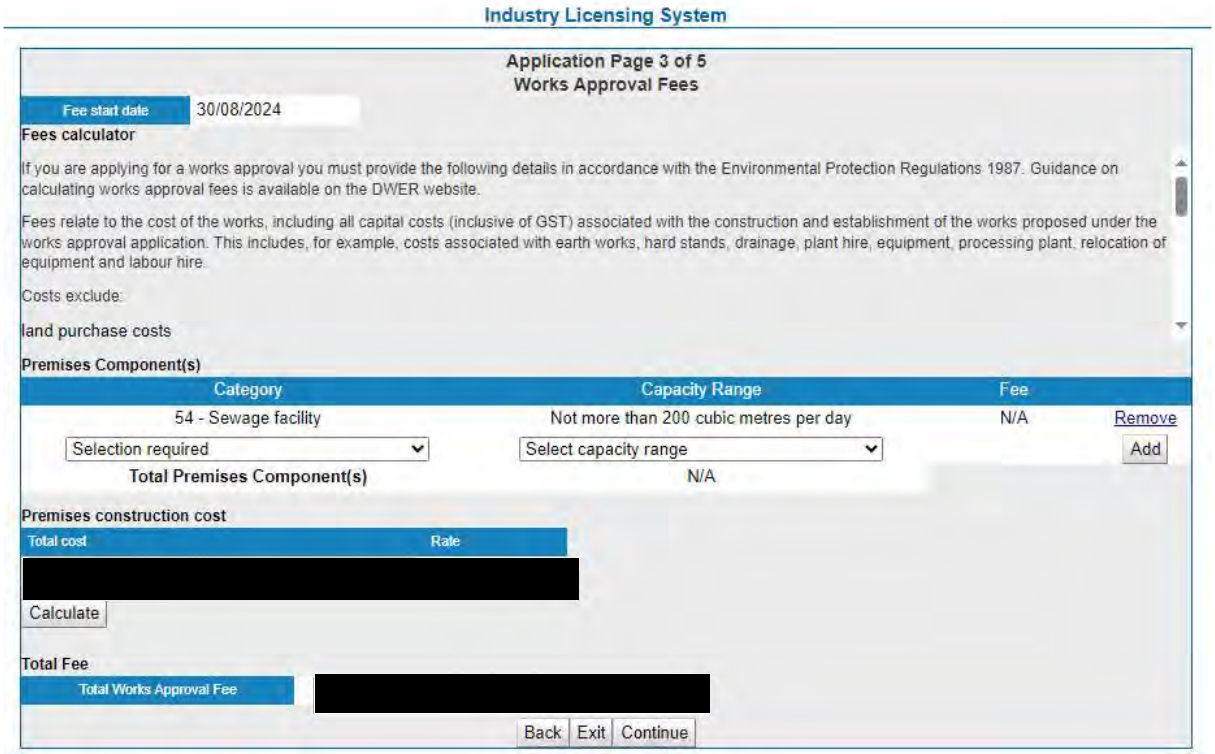
Other aspects will be regularly monitored as per below:

- Inspection of the WWTP to irrigation spray field pipeline; and
- Irrigation spray field water ponding inspection.

11. PROJECT COST

Estimated project cost for the proposed construction of the Eneabba Temporary Construction Camp WWTP which is subject to this Works Approval Application is approximately $1,500,000.

The Works Approval fee has been calculated as $6,300.25 using the DWER online fee calculator as shown below.



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