Government of Western Australia
Department of Water and Environmental Regulation

Works Approval

Works approval number	W6596/2021/1
Works approval holder	IB Operations Pty Ltd
ACN	165 513 557
Registered business address	Level 2 Hyatt Centre, 87 Adelaide Terrace EAST PERTH WA 6004
DWER file number	DER2021/000416
Duration	28/01/2022 to 27/01/2027
Date of issue	28/01/2022
Premises details	North Star Magnetite Project Marble Bar Wastewater Treatment Plant Part of Mining Tenement L45/486 Marble Bar Road MARBLE BAR WA 6760 As defined by the coordinates in Schedule 2

Prescribed premises category description (Schedule 1, *Environmental Protection Regulations 1987*)	**Assessed production / design capacity**
Category 54: 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	180 m^3 per day

This works approval is granted to the works approval holder, subject to the attached conditions, on 28 January 2022, by:

Melissa Chamberlain

Digitally signed by Melissa Chamberlain
Date: 2022.01.28 15:26:12 +08'00'

Melissa Chamberlain
A/MANAGER WASTE INDUSTRIES
REGULATORY SERVICES
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Works approval history

Date	Reference number	Summary of changes
28/01/2022	W6596/2021/1	Works approval granted.

Interpretation

In this works approval:

(a) the words 'including', 'includes' and 'include' in conditions mean "including but not limited to", and similar, as appropriate;

(b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;

(c) where tables are used in a condition, each row in a table constitutes a separate condition;

(d) any reference to an Australian or other standard, guideline, or code of practice in this works approval:

(i) if dated, refers to that particular version; and

(ii) if not dated, refers to the latest version and therefore may be subject to change over time;

(e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and

(f) unless specified otherwise, all definitions are in accordance with the EP Act.

NOTE: This works approval requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this works approval.

Works approval conditions

The works approval holder must ensure that the following conditions are complied with:

Construction phase

Infrastructure and equipment

1. The works approval holder must:

(a) construct and install the infrastructure and/or equipment;

(b) in accordance with the corresponding design and installation requirements; and

(c) at the corresponding infrastructure location

as set out in Table 1.

Table 1: Design, construction and installation requirements

	Infrastructure	Design, construction and installation requirements	Infrastructure location
1.	Wastewater Treatment Plant (WWTP)	The WWTP must be designed and installed to meet the following specifications: a) Comprising of the following equipment: i. Inlet screen. ii. Raw wastewater storage balance tank/s with a combined storage of at least 200kL. iii. Waste sludge storage tank. iv. Anoxic (1 & 2) chamber container. v. Digester and anoxic (3) chamber container. vi. Aeration and membrane bioreactor filtration system chamber container. vii. Control and chemical container. viii. RO brine storage tank/s with a combined storage of at least 100kL. ix. Final blended effluent storage tank/s with a combined storage of at least 100kL. x. Chlorine dosing system. b) All above ground infrastructure to be located on a hardstand with a permeability of 1 x 10^{-9} m/s and be bunded to retain spills within the hardstand area. c) Be able to receive and treat a combined sewage inflow of up to 89m^3/day. d) Able to treat sewage to the following output standards: i. 5-day biochemical oxygen demand (BOD5) <20 mg/L. ii. pH 6.5 – 8.5. iii. Total suspended solids (TSS) <30 mg/L. iv. Total nitrogen (TN) <20 mg/L. v. Total phosphorus (TP) <8 mg/L. vi. *E. coli* <1000 cfu/100mL. vii. Residual free chlorine 0.2mg/L to 2.0mg/L. e) Have a sealed connection point for pumping-out tank sludge for offsite disposal to a licensed waste facility.	As per Schedule 1, Figures 3, 4 and 5

	Infrastructure	Design, construction and installation requirements	Infrastructure location
		f) Flow meters to be installed to record the influent/effluent volumes that are received/sent from the WWTP. Flow meters to be located on the output line after the WWTP. g) Incorporate an alarm system of warning beacons, as well as audible and visual pump fault alarms, which will activate in the event of: i. pump faults. ii. high tank levels. iii. tank overflows. h) Allow for manual operation if necessary.	
2.	Irrigation spray field	**Stage 1** Irrigation spray field to meet the following specifications: a) Installation of 2.6ha of sprinkler units. **Stage 2** Irrigation spray field to meet the following specifications: a) Installation of an additional 1.9ha of sprinkler units (total 4.7ha inclusive of an additional 5m perimeter to allow for spray drift). **All stages** Irrigation spray field to meet the following specifications: a) Above ground sprinklers installed. b) Maintain a 5m spray drift buffer from the edge of the sprinkler radius. c) Maximum slope gradient of 1% across the entire spray field area. d) Ensure no ponding or pooling of blended effluent occurs. e) Ensure that the discharge of blended effluent only occurs over the designated irrigation spray field. f) Fenced with a vehicle access gate. g) Warning signage to be installed on all sides of fencing advising the area is used for the disposal of treated wastewater.	As per Schedule 1, Figure 3 and 6
3.	All infrastructure and equipment	a) All sewage storage and treatment tanks, vessels, pipework, fittings and joins are to be constructed of impervious material and free from leaks and defects. b) All sewage storage and treatment tanks, vessels, pipework, fittings and joins must be designed and constructed to ensure that stormwater does not enter the sewage treatment system and treated wastewater storage infrastructure. c) All pipework, fittings and pumps must be hydraulically tested to the required pressure and visually inspected for any defects to ensure infrastructure is fit for purpose prior to use. d) All chemicals to be stored separately within an above ground vessel/s that is contained within bunds of a	As per Schedule 1

	Infrastructure	Design, construction and installation requirements	Infrastructure location
		capacity of 110% of the total vessel/s contents. e) Chemicals to be stored in accordance with Australian Standards AS1940-2004, AS3780-2008 and/or AS3833-2007 dependent on the type of chemical to be stored.	

Compliance reporting

2. The works approval holder must within 30 calendar days of an item of infrastructure or equipment required by condition 1 being installed:

(a) undertake an audit of their compliance with the requirements of condition 1; and

(b) prepare and submit to the CEO an Environmental Compliance Report on that compliance.

3. The Environmental Compliance Report required by condition 2, must include as a minimum the following:

(a) certification by a civil engineer that the items of infrastructure or component(s) thereof, as specified in condition 1, have been constructed in accordance with the relevant requirements specified in condition 1;

(b) as constructed plans and a detailed site plan for each item of infrastructure or component of infrastructure specified in condition 1; and

(c) be signed by a person authorised to represent the works approval holder and contains the printed name and position of that person.

Environmental commissioning phase

Environmental commissioning requirements and emission limits

4. The works approval holder may only commence environmental commissioning of an item of infrastructure listed in condition 5 once the Environmental Compliance Report has been submitted for that item of infrastructure in accordance with condition 2 of this works approval.

5. Any environmental commissioning activities undertaken for an item of infrastructure specified in Table 2 may only be carried out:

(a) in accordance with the corresponding commissioning requirements; and

(b) for the corresponding authorised commissioning duration as set out in Table 2

Table 2: Environmental commissioning requirements

	Infrastructure	Commissioning requirements	Authorised commissioning duration
1.	Irrigation spray field	**Stage 1**	A period not exceeding 60 calendar days in aggregate
		a) Not more than 143m^3 per day of blended effluent to be applied to the designated spray irrigation area.	
		Stage 2	
		a) Not more than 180m^3 per day of blended effluent to be applied to the designated spray irrigation area.	
		All stages	
		a) Irrigation via low drift fan-spray nozzles spaced for even distribution. b) Irrigation to be managed to prevent ponding and pooling of blended effluent on the ground surface of the irrigation spray field. c) No blended effluent is permitted to run off or discharge beyond the irrigation spray field.	
2.	WWTP and Pipeline	a) Volumetric flow meters are maintained on the WWTP inlet and outlet to the spray irrigation field. b) Sludge is contained within sealed sludge tanks prior to removal by a licensed waste carrier for disposal to a licensed disposal facility. c) Screenings are contained within a sealed bin prior to removal for disposal to a licensed disposal facility. d) Spills of wastewater or chemicals outside of a vessel/container are cleaned up immediately.	

6. During environmental commissioning, the works approval holder must ensure that the emission(s) specified in Table 3, are discharged only from the corresponding discharge point(s) and only at the corresponding discharge point location(s).

Table 3: Authorised discharge points during commissioning

Emission	Discharge point	Discharge point location
Blended effluent	Sprinklers within the irrigation spray field	Irrigation spray field as shown in Schedule 1, Figures 3 and 6

Monitoring during environmental commissioning

7. The works approval holder must monitor emissions during environmental commissioning in accordance with Table 4.

Table 4: Emissions and discharge monitoring during environmental commissioning

Discharge point	Monitoring location	Parameter	Frequency	Averaging period	Unit
Irrigation spray field	WWTP outlet	*E. coli*	Weekly	Spot sample	cfu / 100mL
		Thermotolerant coliforms			
		BOD5			mg/L
		Total suspended solids			
		Total nitrogen			
		Total phosphorus			
		pH[1]	Daily or continuous	N/A	pH units
		Residual chlorine[1]			mg/L
		Cumulative flow volume	Continuous		m^3

Note 1: In-field non-NATA accredited analysis is permitted

8. For the monitoring activity required by condition 7, the works approval holder must:

(a) Record the results

(b) handle and preserve all water samples collected during the monitoring of the WWTP in accordance with AS/NZS 5667.1-1998 Water Quality – Sampling; and

(c) have analysis conducted by a laboratory with current National Association of Testing Authorities (NATA) accreditation for the parameters specified.

Environmental Commissioning Report

9. The works approval holder must submit to the CEO an Environmental Commissioning Report within 30 calendar days of the completion date of environmental commissioning for each item of infrastructure specified in Table 1.

10. The works approval holder must ensure the Environmental Commissioning Report required by condition 9 of this works approval includes the following:

(a) a summary of the environmental commissioning activities undertaken, including date(s) for commencement of commissioning, timeframes and amount of wastewater processed;

(b) a summary of blended effluent monitoring results recorded in accordance with condition 7;

(c) copies of laboratory reports for blended effluent monitoring results recorded in accordance with condition 7;

(d) a summary of the environmental performance of each item of infrastructure or equipment as installed, which at minimum includes:

(i) a comparison of the blended effluent monitoring results against discharge limits specified in condition 15;
(ii) assessment of the irrigation spray field performance against operational requirements in condition 5;

(e) a review of the works approval holder's performance and compliance against the conditions of this works approval; and

(f) where they have not been met, measures proposed to meet the manufacturer's design specifications and the conditions of this works approval, together with timeframes for implementing the proposed measures.

Time limited operations phase

Commencement and duration

11. The works approval holder may only commence time limited operations for an item of infrastructure identified in condition 13 where the Environmental Commissioning Report for that item of infrastructure as required by condition 9 has been submitted by the works approval holder.

12. The works approval holder may conduct time limited operations for an item of infrastructure specified in condition 13:

(a) for a period not exceeding 180 calendar days from the day the works approval holder meets the requirements of condition 11 for that item of infrastructure; or

(b) until such time as a licence for that item of infrastructure is granted in accordance with Part V of the Environmental Protection Act 1986, if one is granted before the end of the period specified in condition 12(a).

Time limited operations requirements and emission limits

13. During time limited operations, the works approval holder must ensure that the premises infrastructure and equipment listed in and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirements set out in Table 5.

Table 5: Infrastructure and equipment requirements during time limited operations

	Site infrastructure and equipment	Operational requirement	Infrastructure location
1.	Irrigation spray field	**Stage 1**	As shown in Schedule 1, Figures 3 and 6
		a) Not more than 143m^3 per day of blended effluent to be applied to the designated irrigation spray field area.	
		Stage 2	
		a) Not more than 180m^3 per day of blended effluent to be applied to the designated irrigation spray field area.	
		All stages	
		a) Irrigation via low drift fan-spray nozzles spaced for even distribution. b) Irrigation to be managed to prevent ponding and pooling of blended effluent on the ground surface of the irrigation spray field. c) No blended effluent is permitted to run off or discharge beyond the irrigation spray	

	Site infrastructure and equipment	Operational requirement	Infrastructure location
		field.	
2.	WWTP and Pipeline	a) Volumetric flow meters are maintained on the RO brine holding tank outlet, WWTP inlet and outlet to the irrigation spray field. b) Sludge is contained within sealed sludge tanks prior to removal by a licensed waste carrier for disposal to a licensed disposal facility. c) Screenings are contained within a sealed bin prior to removal for disposal to a licensed disposal facility. d) Spills of wastewater, RO brine or chemicals outside of a vessel/container to be cleaned up immediately.	As shown in Schedule 1, Figures 3, 4 and 5
3.	RO brine pipeline	a) No more than 91m^3/day of RO brine supplied to the WWTP.	As shown in Schedule 1, Figures 4 and 5.
4.	Chemical storage	a) All chemicals to be stored separately within an above ground vessel/s that is contained within bunds of a capacity of 110% of the total vessel/s contents. b) Chemicals to be stored in accordance with Australian Standards AS1940-2004, AS3780-2008 and/or AS3833-2007 dependent on the type of chemical to be stored.	As shown in Schedule 1, Figures 4 and 5.

14. During time limited operations, the works approval holder must ensure that the emission specified in Table 6, is discharged only from the corresponding discharge points and only at the corresponding discharge point location.

Table 6: Authorised discharge points during time limited operations

Emission	Discharge point	Discharge point location
Blended effluent	Sprinklers within the irrigation spray field	Irrigation spray field as shown in Schedule 1, Figure 3 and 6.

Monitoring during time limited operations

15. During time limited operations, the works approval holder must ensure that the emissions from the discharge point listed in Table 7 does not exceed the corresponding limit(s) when monitored in accordance with condition 16.

Table 7: Emission and discharge limits during time limited operations

Discharge point	Parameter	Concentration limit
Irrigation spray field	BOD_5	20 mg/L
	Total suspended solids	30 mg/L
	Total nitrogen	20 mg/L
	Total phosphorus	8 mg/L
	Thermotolerant coliforms	1,000 cfu/100mL
	Total dissolved solids	2000 mg/L
	Residual chlorine	2.0mg/L
	pH	6.5 to 8.5

16. The works approval holder must monitor emissions during time limited operations in accordance with Table 8.

Table 8: Emissions and discharge monitoring during time limited operations

Discharge point	Monitoring location	Parameter	Frequency	Averaging Period	Unit
Irrigation spray field	WWTP outlet	*E. coli*	Monthly	Spot sample	cfu / 100mL
		Thermotolerant coliforms			
		BOD_5			mg/L
		Total suspended solids			
		Total nitrogen			
		Total phosphorus			
		Total dissolved solids			
		Residual chlorine			
		pH[1]			-
		Cumulative flow volume discharged to the irrigation spray field[1]	Continuous	N/A	m^3
	RO brine pipeline outlet	Cumulative flow volume supplied to the WWTP			

Note 1: In-field non-NATA accredited analysis is permitted

17. For the monitoring activity required by condition 16, the works approval holder must:

(a) record the results;

(b) handle and preserve all water samples collected during the monitoring of the WWTP in accordance with Australian Standard 5667.1:1998 Water Quality – Sampling; and

(c) have analysis conducted by a laboratory with current National Association of Testing (NATA) accreditation for the parameters specified.

Compliance reporting

18. The works approval holder must submit to the CEO a report on the time limited operations within 30 calendar days of the completion date of time limited operations or 30 calendar days before the expiration date of the works approval, whichever is the sooner.

19. The works approval holder must ensure the report required by condition 18 includes the following:

(a) a summary of the time limited operations, including date(s) for commencement of time limited operations, timeframes and amount of wastewater processed;

(b) a summary of monitoring parameter results obtained during time limited operations under condition 16.

(c) copies of laboratory reports for blended effluent monitoring results recorded in accordance with condition 16;

(d) a summary of the environmental performance of each item of infrastructure or equipment as installed, which at minimum includes:

(i) a comparison of the blended effluent monitoring results against discharge limits specified in condition 15;

(ii) assessment of the spray irrigation field performance against operational requirements in condition 13;

(e) a review of performance and compliance against the conditions of the works approval and the Environmental Commissioning Report; and

(f) where the specifications and the conditions of this works approval have not been met, what measures will the works approval holder take to meet them, and what timeframes will be required to implement those measures.

Records and reporting (general)

20. The works approval holder must record the following information in relation to complaints received by the works approval holder (whether received directly from a complainant or forwarded to them by the Department or another party) about any alleged emissions from the premises:

(a) the name and contact details of the complainant, (if provided);

(b) the time and date of the complaint;

(c) the complete details of the complaint and any other concerns or other issues raised; and

(d) the complete details and dates of any action taken by the works approval holder to investigate or respond to any complaint.

21. The works approval holder must maintain accurate and auditable books including the following records, information, reports, and data required by this works approval:

(a) the works conducted in accordance with condition 1;

(b) any maintenance of infrastructure that is performed in the course of complying with condition 5 and 13;

(c) monitoring programmes undertaken in accordance with conditions 7 and 16; and

(d) complaints received under condition 20.

22. The books specified under condition 21 must:

(a) be legible;

(b) if amended, be amended in such a way that the original version(s) and any subsequent amendments remain legible and are capable of retrieval;

(c) be retained by the works approval holder for the duration of the works approval; and

(d) be available to be produced to an inspector or the CEO as required.

Definitions

In this works approval, the terms in Table 9 have the meanings defined.

Table 9: Definitions

Term	Definition
AS 1940-2004	means Australian Standard 1940-2004 The storage and handling of flammable and combustible liquids.
AS 3780-2008	means Australian Standard 3780-2008 The storage and handling of corrosive substances.
AS/NZS 3833:2007	means Australian Standard/New Zealand Standard 3833:2007 The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers.
AS/NZS 5667.1-1998	means Australian Standard/New Zealand Standard 5667.1-1998 Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples.
blended effluent	means treated wastewater from the wastewater treatment plant blended with RO brine reject.
books	has the same meaning given to that term under the EP Act.
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 info@dwer.wa.gov.au
cfu	colony forming units
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.
discharge	has the same meaning given to that term under the EP Act.
emission	has the same meaning given to that term under the EP Act.
environmental commissioning	means the sequence of activities to be undertaken to test equipment integrity and operation, or to determine the environmental performance, of equipment and infrastructure to establish or test a steady state operation and confirm design specifications.

Term	Definition
Environmental Commissioning Report	means a report on any commissioning activities that have taken place and a demonstration that they have concluded, with focus on emissions and discharges, waste containment, and other environmental factors.
Environmental Compliance Report	means a report to satisfy the CEO that the conditioned infrastructure and/or equipment has been installed in accordance with the works approval.
EP Act	*Environmental Protection Act 1986* (WA).
EP Regulations	*Environmental Protection Regulations 1987* (WA).
ha	hectare
kL	kilolitres
m^3	cubic metres
mg/L	milligrams per litre
mL	milliliter
NATA	National Association of Testing Authorities
NATA accreditation	means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis
premises	the premises to which this works approval applies, as specified at the front of this works approval and as shown on the premises map (Figure 1) in Schedule 1 to this works approval.
prescribed premises	has the same meaning given to that term under the EP Act.
RO	Reverse Osmosis
spot sample	means a discrete sample representative at the time and place at which the sample is taken.
time limited operations	refers to the operation of the infrastructure and equipment identified under this works approval that is authorised for that purpose, subject to the relevant conditions.
waste	has the same meaning given to that term under the EP Act.
works approval	refers to this document, which evidences the grant of the works approval by the CEO under section 54 of the EP Act, subject to the conditions.

Term	Definition
works approval holder	refers to the occupier of the premises being the person to whom this works approval has been granted, as specified at the front of this works approval.
WWTP	wastewater treatment plant

END OF CONDITIONS

Schedule 1: Maps

Premises map

The boundary of the prescribed premises is shown in the map below (Figure 1).

Figure 1: Map of the boundary of the prescribed premises

Prescribed premises location

The prescribed premises location is shown in the map below (Figure 2).

Figure 2: Map of the prescribed premises location

Infrastructure layout map

The infrastructure layout is shown in the map below (Figure 3).

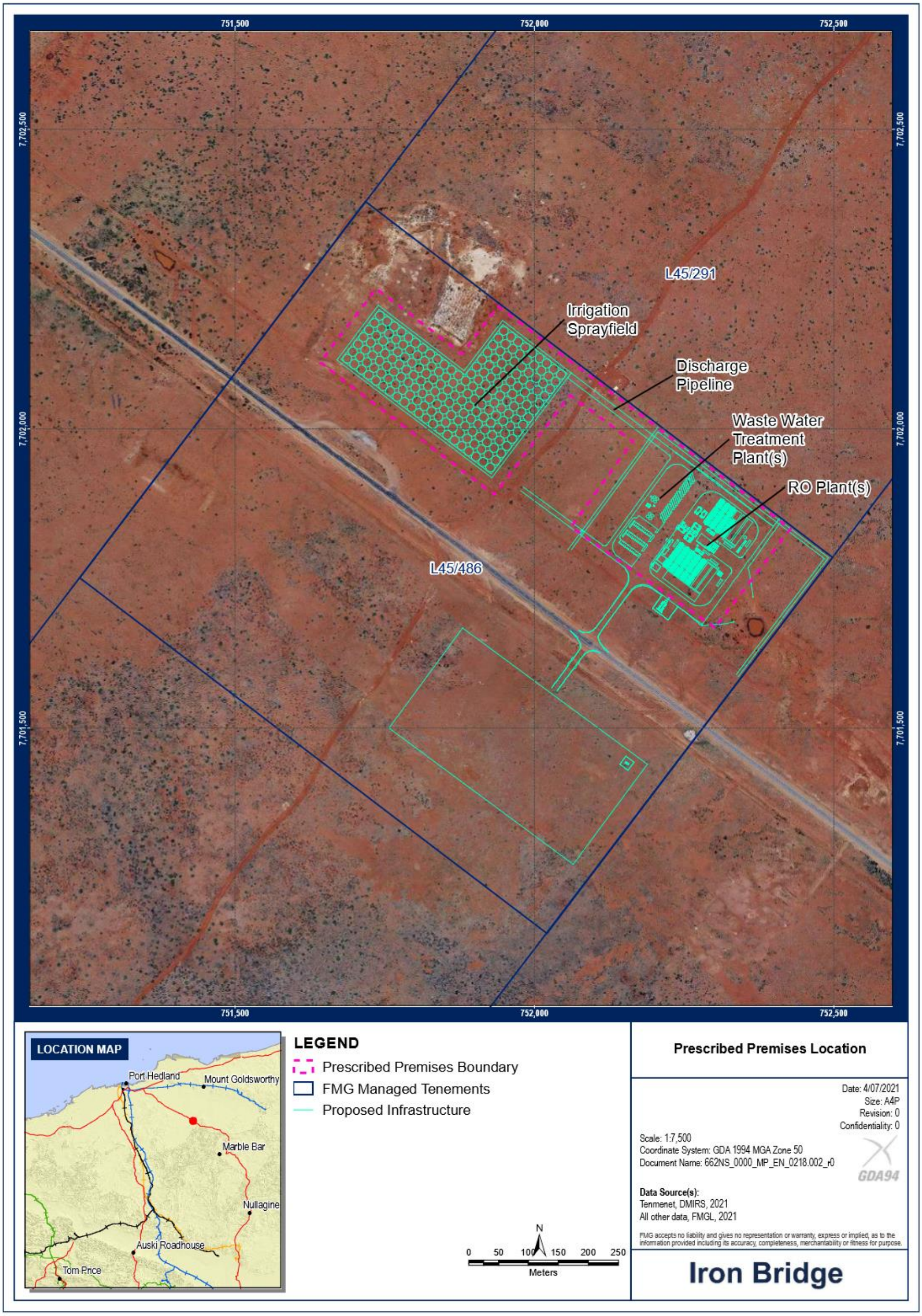

Figure 3: Map of the infrastructure layout

WWTP layout map

The WWTP layout map is shown in the map below (Figure 4).

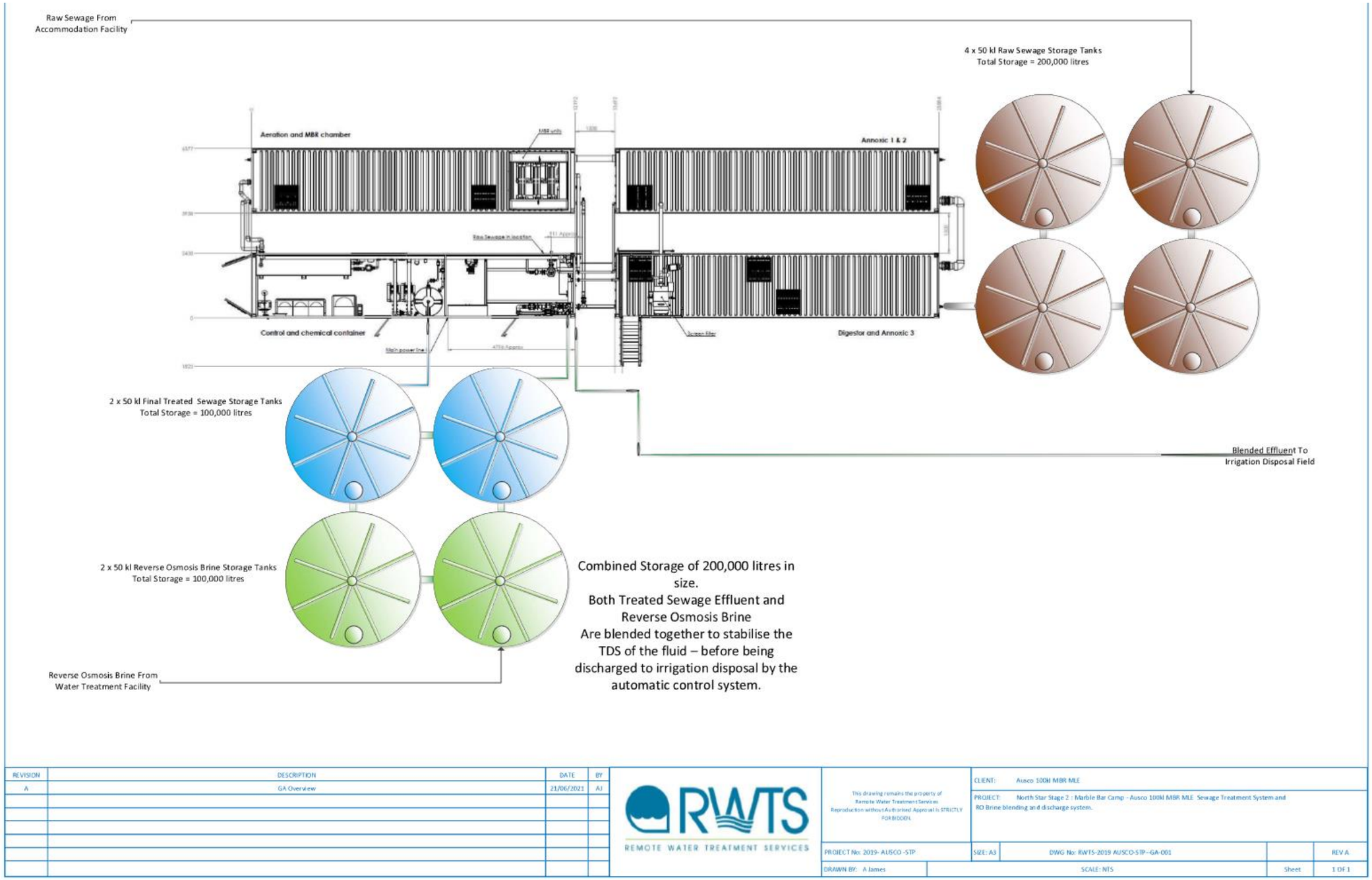

Figure 4: Map of the WWTP layout

WWTP schematic map

The WWTP schematic map is shown in the map below (Figure 5).

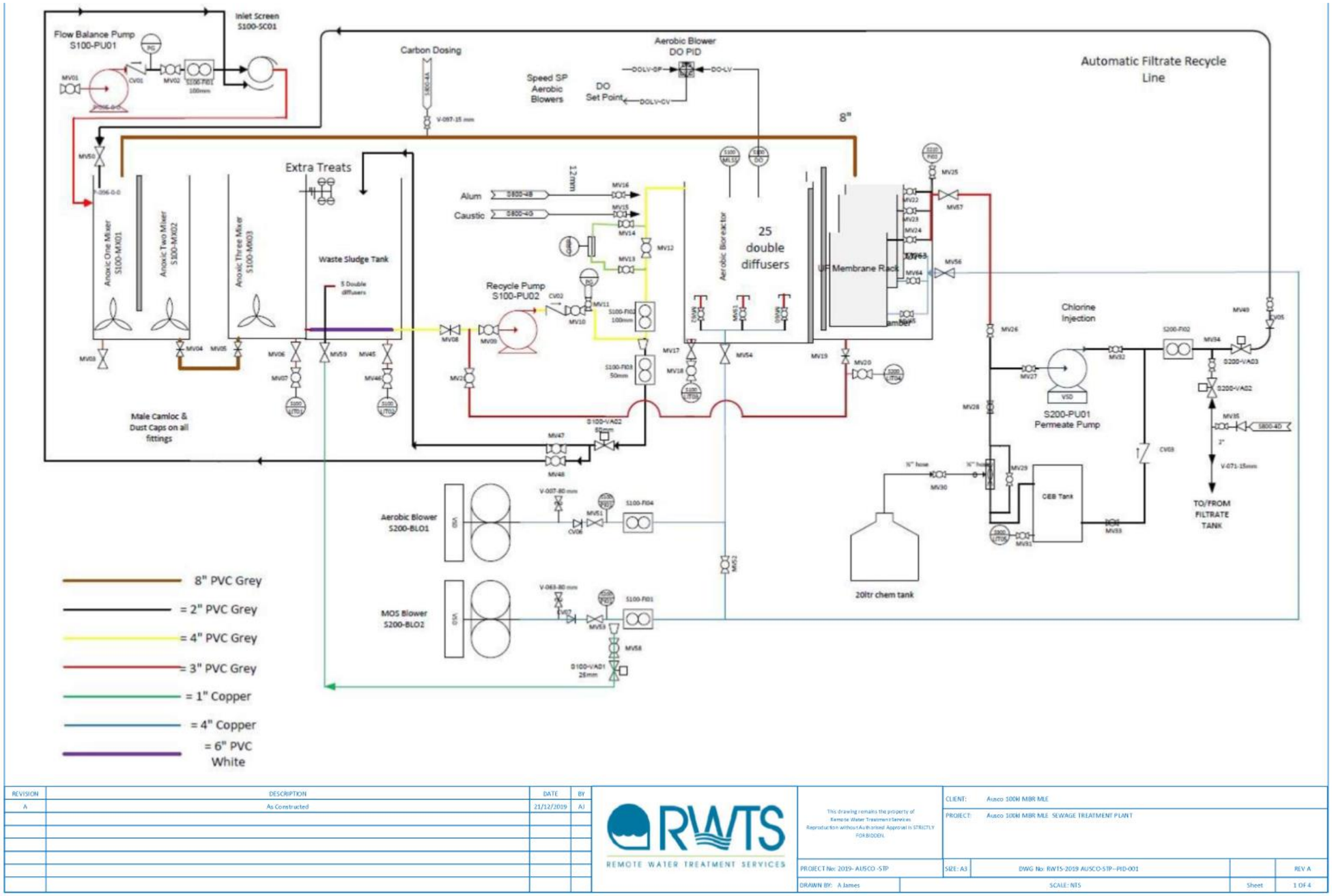

Figure 5: Map of the WWTP schematic

Irrigation spray-field map

The irrigation spray-field is shown in the map below (Figure 6).

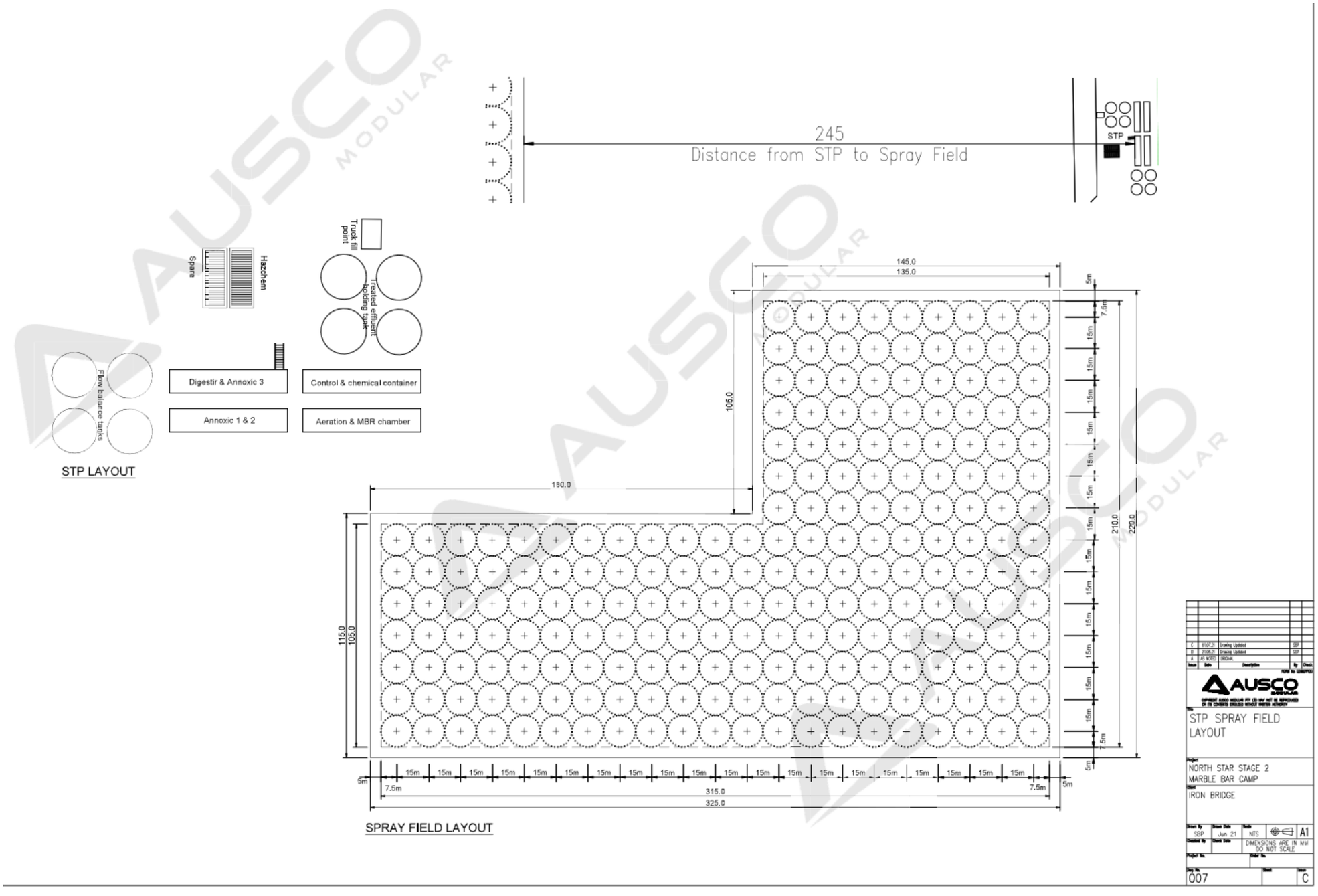

Figure 6: Map of the irrigation spray-field

Schedule 2: Premises boundary

The premises boundary in Figure 1 is defined by the coordinates in Table 10.

Table 10: Premises boundary coordinates (GDA 2020)

Reference Point	Easting	Northing	Zone
1	751641.70160	7702110.48857	50
2	751735.48260	7702233.85517	50
3	751878.82560	7702124.93377	50
4	751939.14400	7702204.29217	50
5	752427.28910	7701832.94337	50
6	752301.20840	7701667.84017	50
7	752060.79670	7701835.73387	50
8	752163.93200	7701978.91567	50
9	752058.53470	7702055.70737	50
10	751932.31110	7701889.64097	50