Licence

Licence Number	L6131/1990/13
Licence Holder	Pilbara Manganese Pty Ltd
ACN	074 106 577
Registered business address	L2/24 Outram Street WEST PERTH WA 6005
File Number	DER2013/001337-1
Duration	01/10/2013 to 30/09/2028
Date of issue	26/09/2013
Date of amendment	05/09/2024
Premises	Woodie Woodie Manganese Project Mining tenements: G45/332, G45/333, G45/334, G45/335, G45/336, G45/37-40, G46/4-5, L46/29, M45/107, M45/429-433, M45/517, M45/600-602, M45/637-641, M45/1218, M46/92-93, M46/108, M46/137, M46/150, M46/161-162, M46/383, M46/384, G45/279-284 MARBLE BAR WA 6760

Category number	Approved Premises production or design capacity
5 - Processing or beneficiation of metallic or nonmetallic ore	5,000,000 tonnes per annual period
6 - Mine dewatering	55,188,000 tonnes per annual period
54 - Sewage facility	300 cubic metres per day
73 - Bulk storage of chemicals	2,144 cubic metres in aggregate
89 - Putrescible landfill site	1,950 tonnes per annual period

This Licence amendment is granted to the Licence Holder, subject to the following conditions, on 5 September 2024 by:

Timothy Moran
Digitally signed by Timothy Moran
Date: 2024.09.05 11:47:29 +08'00'

MANAGER – RESOURCE INDUSTRIES

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Licence history

Reference number	Date	Summary of changes
L6131/1990/9	1/10/2004	Licence reissue.
28/4/2006	28/4/2006	Licence amendment.
28/09/2006	L6131/1990/10	Licence reissue.
18/9/2008	L6131/1990/11	Licence reissue. Added category 54 and 89 to the licence.
30/9/2010	L6131/1990/12	Licence reissue. Added conditions for WWTP monitoring, landfill management and targets for dewatering monitoring.
29/3/2012	L6131/1990/12	Proponent amendment: Additional conditions for tyre disposal, bioremediation facility management, changes annual period and update monitoring sites.
26/09/2013	L6131/1990/13	Licence reissue and REFIRE conversion.
30/04/2015	L6131/1990/13	Proponent requested licence amendment.
26/11/2015	L6131/1990/13	Proponent requested licence amendment.
25/02/2016	L6131/1990/13	Licence amended to add tenements, include the Greensnake landfill and remove improvement conditions for the bioremediation facility.
29/04/2016	L6131/1990/13	Department initiated amendment in accordance with section 59(1)(k) of the Act to amend the duration of the licence date month year.
30/06/2016	L6131/1990/13	Licence amended as the mine went in Care and Maintenance and to reduce the frequency of TSF inspections from daily to weekly and converting back to the Telfer's weather stations for weather records.
22/12/2016	L6131/1990/13	Amendment Notice: Licence Holder advised that the mine will resume operation and TSF inspections revert back to daily. Condition 4.3.1 was amended to reduce the required period of notice.
31/03/2017	L6131/1990/13	Amendment Notice 2: a Licence Holder initiated amendment to include the Homestead In-Pit tailing storage and its groundwater monitoring bores that were approved via works approval W5821/2015/1. Additional parameters for mine dewatering discharge were added and ambient surface water quality respectively have been updated to include chloride, sulfate, sodium, potassium, cobalt, iron, nickel, selenium, mercury, chromium(VI) and total chromium to fully assess the potential impacts of discharging dewatering effluent to rivers near the mine site.
1/11/2017	L6131/1990/13	Amendment Notice 3: on 21 August 2017 the Licence Holder applied for the following changes: • Change in treatment methods for the licensed WWTP; and • To allow dewatering water from Hunter pit to be discharged into Cracker Sedimentation Pond, prior to discharge to Muddauthera Creek.
2/05/2018	L6131/1990/13	Amendment Notice 4: on 19 December 2017 the Licence Holder applied for the following amendments to the licence: • Construction and operation of a new bioremediation area

		on top of the Greensnake Western Waste Dump; and Disposal of waste tyres within the Chutney/Vespa Waste Dump. On 1 March 2017 an application for additional amendment received for the following: • An increase to the approved throughput for Category 89 from 1,650 tonnes per annum (tpa) to 1,950 tpa.
30/01/2019	L6131/1990/13	Amendment Notice 5: on 25 October 2018 the Licence Holder applied for the following amendment in the licence: • Dispose waste tyres within the Paystar Waste Dump; • Dispose waste tyres within the Bells West Pit; • Extend the Greensnake Landfill footprint; • Dispose dewatering discharge from Extension Cord pit into Paystar pit; and Dispose dewatering discharge from Topvar Pit into Cracker (W1) sedimentation pond, which discharges to Muddauthera Creek.
29/07/2020	L6131/1990/13	DWER initiated amendment to consolidate/ amalgamate separately issued Licence amendment notices in the main Licence.
5/09/2024	L6131/1990/13	Licence amendment to increase maximum daily treated wastewater effluent volume from 150 m3 to 300 m3 with the inclusion of reject water from the Reverse Osmosis Plant, and to authorise the disposal of conveyor belt waste in the Bells West Landfill Facility.

Interpretation

In this licence:

(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 licence:

  (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 licence requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this licence.

Licence conditions

General conditions

1. The Licence Holder must immediately recover or remove and dispose of spills of environmentally hazardous materials outside an engineered containment system.

Premises operation

2. The Licence Holder must ensure that all pipelines containing environmentally hazardous materials are either:
   (a) equipped with telemetry system and pressure sensors along pipelines to allow the detection of leaks and failures; or
   (b) equipped with automatic cut-outs in the event of a pipe failure; or
   (c) provided with secondary containment sufficient to contain any spill for a period equal to the time between routine inspections.
3. The Licence Holder must ensure that waste materials are only stored/treated within vessels or compounds provided with the infrastructure detailed in Table 1 and identified on the Premises map in Schedule 1.

Table 1: Containment infrastructure

Containment point reference	Material	Specification
Demon Pit TSF (DEPTSF)	Tailings	A minimum total freeboard of 820 mm from the top of the pit crest is maintained at all times
Dartmoor Pit TSF (DAPTSF)		
Malta Pit TSF (MAPTSF)		
Area 1 Pit TSF (A1PTSF)		
Homestead TSF (HPTSF)		
Process Water Pond	TSF return water and mine dewater	A minimum total freeboard of 500 mm or a 1 in 100 year/72 hour storm event (whichever is greater) from the top of the embankment is maintained at all times. Methods of operation minimise the likelihood of erosions of the embankment by wave action.
Bioremediation Facility	Hydrocarbon contaminated waste	Base and bunding clay lined. Stormwater runoff diverted so as not to flow onto the treatment facility.

4. The Licence Holder must manage each TSF detailed in Table 1 such that the supernatant pond on the TSF is minimised as far as practicable.
5. The Licence Holder must undertake an annual water balance for each TSF detailed in Table 1. The water balance must as a minimum consider the following:
   (a) site rainfall;
   (b) evaporation;
   (c) decant water recovery volumes;

(d) seepage recovery volumes; and

(e) volumes of tailings deposited.

6. The Licence Holder must:

(a) undertake inspection as detailed in Table 2;

(b) where any inspection identifies that an appropriate level of environmental protection is not being maintained, take corrective action to mitigate adverse environmental consequences as soon as practicable; and

(c) maintain record of all inspections undertaken.

Table 2: Inspection of infrastructure

Scope of inspection	Type of inspection	Frequency of inspection
Tailings pipelines	Visual integrity and leak assessment	Daily when the facilities are active
Tailings return water lines		
Embankment freeboards of containment infrastructure listed in Table 1	Visual to confirm required freeboard capacity is available	Weekly when the facilities are inactive

7. The Licence Holder must ensure groundwater levels within the zone of influence at monitoring bores detailed in Table 17 and shown in Schedule 1, does not exceed the limit specified in Table 3.

Table 3: Groundwater level controls

Parameter	Limit (mbgl)	Averaging Period
Groundwater	4	Spot Sample

8. The Licence Holder must, when standing water levels rise higher than 6 mbgl within monitoring bores detailed in Table 17 and shown in Schedule 1, provide the CEO with the following information:

(a) the monitoring bore location;

(b) the root cause analysis for the exceedances; and

(c) a description of remedial measures taken or planned to be taken.

9. The Licence Holder must ensure that where wastes produced on the Premises are not taken offsite for lawful use or disposal, they are managed in accordance with the requirements of Table 4.

Table 4: Management of Waste

Facility	Waste type	Processes	Requirements[1,2]
Kia landfill Greensnake landfill	Clean Fill	Storage and disposal of waste by landfilling	**<u>All waste types</u>** No more than 1,950 tonnes per year of all waste types cumulatively shall be disposed of by landfilling.
	Putrescible Waste		
	Inert Waste Type 1		

Greensnake Tyre Disposal Facility Vespa/Chutney Waste Dump Paystar Waste Dump Bells West Pit	Inert Waste Type 2		Disposal of waste by landfilling must only take place within the Kia landfill, Greensnake landfill, Paystar Waste Dump, Bells West Pit, Greensnake Tyre Disposal Facility and Vespa Waste Dump shown on the Premises map in Schedule 1. The separation distance between the base of the landfill and the highest groundwater level must be not less than 3 metres. **Tyres (Inert Waste Type 2)[2]** Tyres must only be landfilled within the Greensnake Tyre Disposal Facility, Vespa Waste Dump, Paystar Waste Dump and Bells West Pit shown on the Premises map in Schedule 1. Tyres must consist of batches of no more than 1,000 tyres or 40 m^3 of tyre pieces. Batches must be separated from each other by at least 100 mm of soil. **Conveyor Belt (Inert Waste Type 2)[2]** No more than 600 tonnes of conveyor belts must be disposed of by landfilling. Disposal of conveyor belts can only take place within the Greensnake Tyre Disposal Facility and the Bells West Landfill Facility shown on the Premises map in Schedule 1. Conveyor belts must be batched in volumes of 40 m^3 or less with batches separated by 100 mm or more of soil. The disposal site of tyres and conveyor belts must be surveyed and recorded for location and relative level.
Wastewater treatment plant	Sewage	Biological, physical and chemical treatment.	No more than 300 m^3 per day

Note 1: Requirements for landfilling tyres are set out in Part 6 of the Environmental Protection Regulations 1987.
Note 2: Additional requirements for the acceptance and landfilling of controlled waste (including asbestos and tyres) are set out in the Environmental Protection (Controlled Waste) Regulations 2004.

10. The Licence Holder must manage the landfilling activities to ensure:

(a) waste is placed and compacted to ensure all faces are stable and capable of retaining rehabilitation material; and

(b) rehabilitation of a cell or phase takes place within 6 months after disposal in that cell or phase has been completed.

11. The Licence Holder must ensure that cover is applied and maintained on landfilled wastes in accordance with Table 5 and that sufficient stockpiles of cover are maintained on site at all times.

Table 5: Cover requirements[1]

Waste Type	Material	Depth	Timescales
Inert Waste Type 1	No cover required		
Putrescible Waste	Type 1 Inert waste or soil	300 mm	Weekly or as soon as practicable after deposit.
Inert Waste Type 2		500 mm	As soon as practical following the achievement of final waste levels in the area(s) in which tyres are deposited.

Note 1: Additional requirements for the covering of tyres are set out in Part 6 of the Environmental Protection Regulations 1987.

12. The Licence Holder must take all reasonable and practical measures to ensure that no wind-blown waste escapes from the Premises and that wind-blown waste is collected on at least a weekly basis and returned to the tipping area.

13. The Licence Holder must manage the irrigation of treated wastewater such that:

(a) no irrigation generated run-off, spray drift or discharge occurs beyond the boundary of the defined irrigation area(s);

(b) treated wastewater is evenly distributed over the irrigation area;

(c) no soil erosion occurs;

(d) irrigation does not occur on land that is waterlogged; and

(e) vegetation cover is maintained over the irrigation area.

14. The Licence Holder must construct the Hunter, Extension Cord and Topvar dewatering pipelines in accordance with the requirements specified in the infrastructure requirements detailed in Table 6. The Licence Holder must not depart from the requirements specified in Table 6 except:

(a) where such departures are minor in nature and do not materially change or affect the infrastructure; or

(b) where such departure improves the functionality of the infrastructure and does not increase the risks to public health, public amenity or the environment;

and all other conditions in this Licence are still satisfied.

Table 6: Infrastructure requirements

Infrastructure	Requirements (design and construction)
Extension Cord / Chutney pipeline	• Constructed of high density polyethylene • Pipeline contained within windrows, constructed from inert material • Flow meters installed to record volume of all water discharged into the Paystar pit
Topvar pipeline	• Constructed of high density polyethylene • Pipeline contained within windrows, constructed from inert material • Flow meters installed to record volume of all water discharged into the Cracker Sedimentation Pond

Emissions

General

15. The Licence Holder must record and investigate the exceedance of any descriptive or numerical limit specified in any part of section 2 of this Licence.

Point source emissions to surface water

16. The Licence Holder must ensure that where waste is emitted to surface water from the emission points in Table 7 and identified on the map of emission points in Schedule 1 it is done so in accordance with the conditions of this Licence.

Table 7: Emission points to surface water

Emission point reference on Map of emission points	Emission point reference	Description	Source including abatement
W1	Cracker (CK1)	Discharge to Muddauthera Creek	Sedimentation Pond originating from dewatering at Austin, Big Mack, Lucy Mack, Demon, Hunter SE, Hunter and Topvar pits.
W2	Hunter (H2)		Sedimentation Pond originating from dewatering at Hunter pit.
W3	Radio Hill (RH1)		Sedimentation Pond originating from dewatering at Radio Hill pit.
W4	Sardine (SD1)		Sedimentation Pond originating from dewatering at Dhufish pit.
W5	Greensnake (GS1)	Discharge to Warri Warri Creek	Sedimentation Pond originating from dewatering at Greensnake pit.
W6	Lox (LX1)		Sedimentation Pond originating from dewatering at Lox pit.
W7	Airport (AP1)	Discharge to Brumby Creek	Sedimentation Pond originating from dewatering at Airport pit.
W8	Chris D (CD1)		Sedimentation Pond originating from dewatering at Chris D pit.
W9	Chutney (CT1)		Sedimentation Pond originating from dewatering at Chutney/Extension cord pits and Paystar.
W10	Homestead (HS1)		Sedimentation Pond originating from dewatering at Homestead pit.
W11	Rhodes (RD)		Sedimentation Pond originating from dewatering at Rhodes pit.
W12	Topvar (TD)		Dewatering from Big Mack pit and the Topvar Hub Dewatering Bores

W13	Paystar	Evaporate and reinfiltrate into the unconfined aquifer	Dewatering from Chutney/Extension Cord pit

17. The Licence Holder must not cause or allow point sources emissions to surface water greater than the limits listed in Table 8.

Table 8: Point source emission limits to surface water

Emission point reference	Parameter	Limit (including units)	Averaging period
W1- W12	Total Suspended Solids	80 mg/L	Spot sample

Emissions to land

18. The Licence Holder must ensure that where waste is emitted to land from the emission points in Table 9 and identified on the maps of emission points in Schedule 1 it is done so in accordance with the conditions of this licence.

Table 9: Emissions to land

Emission point reference on Maps of emission points	Emission point reference	Description	Source including abatement
L1	Storage pond	Pipe from oily water separator into unlined storage pond	Treated wastewater from oil water separator originating from Greensnake workshop and wash down area
L2 – L2a or L2b (dependent on disposal pattern)	Irrigation area	Effluent from accommodation camp wastewater treatment plant to on-site irrigation area	Treated effluent from wastewater treatment plant

20. The Licence Holder must not cause or allow emissions to land greater than the limits listed in Table 10.

Table 10: Emissions limits to land

Emission point reference	Parameter	Limit (including units)	Averaging period
L1	Total Recoverable Hydrocarbon	15 mg/L	Spot sample
L2 – L2a or L2b (dependent on disposal pattern)	Load of Total Nitrogen (TN)	480 kg/ha	Annual
	Load of Total Phosphorus (TP)	120 kg/ha	
	Total Dissolved Solids (TDS)	2,000 mg/L	Spot sample

Monitoring

General Monitoring

21. The Licence Holder must ensure that:

(a) all water samples are collected and preserved in accordance with AS/NZS 5667.1 unless otherwise indicated in the relevant table;

(b) all wastewater sampling is conducted in accordance with AS/NZS 5667.10;

(c) all surface water sampling is conducted in accordance with AS/NZS 5667.4, AS/NZS 5667.6 or AS/NZS 5667.9 as relevant;

(d) all groundwater sampling is conducted in accordance with AS/NZS 5667.11;

(e) all sediment sampling is conducted in accordance with AS/NZS 5667.12;

(f) all microbiological samples are collected and preserved in accordance with AS/NZS 2031; and all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured unless indicated otherwise in the relevant table.

22. The Licence Holder must ensure that:

(a) monthly monitoring is undertaken at least 15 days apart;

(b) quarterly monitoring is undertaken at least 45 days apart; and

(c) six monthly monitoring is undertaken at least 5 months apart.

23. The Licence Holder must ensure that all monitoring equipment used on the Premises to comply with the conditions of this Licence is calibrated in accordance with the manufacturer's specifications.

24. The Licence Holder must, where the requirements for calibration cannot be practicably met, or a discrepancy exists in the interpretation of the requirements, bring these issues to the attention of the CEO accompanied with a report comprising details of any modifications to the methods.

Monitoring of point source emissions to surface water

25. The Licence Holder must undertake the monitoring of emission points in Table 11 at locations identified on the map of monitoring points in Schedule 1 according to the specifications in that table.

Table 11: Monitoring of point source emissions to surface water

Emission point reference	Parameter	Units	Frequency
W1 W2 W3 W4 W5 W6 W7 W8 W9	Volume (cumulative)	m^3	Continuous
	pH[1]	pH units	Monthly
	Total Dissolved Solids	mg/L	
	Nitrate and Nitrite Nitrogen	mg/L	
	Total Kjeldahl Nitrogen	mg/L	
	Total Nitrogen	mg/L	
	Filterable Reactive Phosphorus	mg/L	

W10 W11 W12 W13	Total Phosphorus	mg/L	
	Sodium	mg/L	
	Magnesium	mg/L	
	Zinc[2]	mg/L	
	Lead[2]	mg/L	
	Cadmium[2]	mg/L	
	Manganese	mg/L	
	Chloride	mg/L	
	Sulfate	mg/L	
	Potassium	mg/L	
	Cobalt	mg/L	
	Iron	mg/L	
	Nickel	mg/L	
	Selenium	mg/L	
	Mercury	mg/L	
	Chromium (VI)	mg/L	
	Total Chromium	mg/L	

Note 1: In-field non-NATA accredited analysis permitted.
Note 2: With adjustments for hardness as per ANZECC (2000) guidelines

Monitoring of emissions to land

26. The Licence Holder must undertake the monitoring of emission points in Table 12 at locations identified on the maps of monitoring points in Schedule 1 according to the specifications in the table.

Table 12: Monitoring of emissions to land

Emission point reference	Parameter	Units	Frequency
L1	Total Recoverable Hydrocarbon	mg/L	Quarterly
L2a or L2b (dependent on disposal pattern)	pH[1]	pH units	
	Biochemical Oxygen Demand	mg/L	
	Total Suspended Solids	mg/L	
	Total Nitrogen	mg/L	
	Total Phosphorus	mg/L	
	E.coli	cfu/100mL	
	Total Dissolved Solids (TDS)	Mg/L	

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

Monitoring of inputs and outputs

27. The Licence Holder must undertake the monitoring in Table 13 according to the specification is that table.

Table 13: Monitoring of inputs and outputs

Input/ Output	Parameter	Units	Averaging Period	Frequency
Treated Wastewater	Volume (cumulative) recycled for on-site irrigation from the Wastewater Treatment Plant and Reverse Osmosis Plant	m^3	Monthly	Continuous
Waste Inputs	Inert Waste Type 1, Inert Waste Type 2, Putrescible Waste, and Clean Fill	tonnes or m^3	N/A	Each load disposed

Process monitoring

28. The Licence Holder must undertake the monitoring in Table 14 according to the specifications in that table.

Table 14: Process monitoring

Process description	Parameter	Units	Averaging Period	Frequency
Tailings deposition	Volume of tailings deposited into each TSF	m^3	Monthly	None specified
	Volume of water recovered from each TSF			

Ambient environmental quality monitoring

29. The Licence Holder must undertake the monitoring of monitoring points in Tables 15, 16, 17 and 18 at locations identified on the map of monitoring points in Schedule 1 according to the specifications in those tables.

Table 15: Monitoring of ambient surface water quality

Monitoring point reference and location	Parameter	Units	Averaging period	Frequency
Downstream sites: Muddauthera Creek (MMS) Warri Warri (WWMS) Brumby Creek (BMS)	pH[1]	pH units	Spot sample	Monthly
	Total Dissolved Solids	mg/L		
	Total Suspended Solids			
	Nitrate and Nitrite Nitrogen			
	Total Kjeldahl Nitrogen			
	Total Nitrogen			
	Filterable Reactive Phosphorus			
	Total Phosphorus			
	Sodium			
	Magnesium			
	Zinc[2]			
	Lead[2]			
	Cadmium[2]			
	Manganese			
	Chloride			
	Sulfate			

	Potassium			
	Cobalt			
	Iron			
	Nickel			
	Selenium			
	Mercury			
	Chromium (VI)			
	Total Chromium			
Background site: Lower Carawine Gorge Pool (CG1) Tooma Stockyard (TS) Tooncoonaragee Pool (TC1) Oakover Crossing (OC)	pH[1]	pH units	Spot sample	Monthly (when accessible)
	Total Dissolved Solids	mg/L		
	Total Suspended Solids			
	Nitrate and Nitrite Nitrogen			
	Total Kjeldahl Nitrogen			
	Total Nitrogen			
	Filterable Reactive Phosphorus			
	Total Phosphorus			
	Sodium			
	Magnesium			
	Zinc[2]			
	Lead[2]			
	Cadmium[2]			
	Manganese			
	Chloride			
	Sulfate			
	Potassium			
	Cobalt			
	Iron			
	Nickel			
	Selenium			

	Mercury			
	Chromium (VI)			
	Total Chromium			
	Chlorophyll-a	µg/L		
	Phaeophytin			

Note 1: In-field non-NATA accredited analysis permitted.
Note 2: With adjustments for hardness as per ANZECC (2000) guidelines.

Table 16: Monitoring of sediment quality

Monitoring point reference and location	Parameter	Units	Averaging period	Frequency
Background site: Lower Carawine Gorge Pool (CG1) Tooma Stockyard (TS) Tooncoonaragee Pool (TC1) Oakover Crossing (OC)	Chlorophyll-a	mg/m^2	Spot sample	Monthly (when accessible)
	Phaeophytin	mg/m^2		

Table 17: Monitoring of ambient groundwater quality

Monitoring point reference and location	Parameter	Units	Averaging period	Frequency
Demon Pit TSF DEPTSFMB01 DEPTSFMB02 DEPTSFMB04 TSF2 TDMB1 Dartmoor TSF DAPTSFMB01 DAPTSFMB02 Malta TSF MAPTSFMB01 Homestead TSF HPTSFMB01 HPTSFMB02 HPTSFMB03	Standing water level	mbgl	Spot sample	Quarterly
	pH[1]	pH units		
	Total Dissolved Solids	mg/L		
	Total Nitrogen	mg/L		
	Arsenic	mg/L		
	Copper	mg/L		
	Molybdenum	mg/L		
	Selenium	mg/L		
	Uranium	mg/L		
	Hexavalent Chromium	mg/L		

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

Table 18: Monitoring of vegetation health

Monitoring point reference and location	Parameter	Averaging period	Frequency
Brumby Creek Crossing (V1) Lower Carawine Pool (V2) Muddauthera Crossing (V3) Running Water Pool (V4) Tooma Stockyards (V5) Warri Warri Creek Crossing (V6) WWTP Irrigation Area (as displayed in Figure 6)	Visually estimate the average foliage cover of the species *Eucalyptus camaldulensis* and *Melaleuca argentea*	Visual inspection	Six monthly
	Score the health condition of the species *Eucalyptus camaldulensis* and *Melaleuca argentea*		
	General environmental description of the site and record any changes since previous monitoring		
	Take replicate photographs of foliage density and shadow areas beneath trees		

30. The Licence Holder must take the relevant action in the case of an event in Table 19.

Table 19: Management Action

Monitoring point reference	Event/action reference	Event	Management action
V1 – V6	EA1	20% reduction in the average foliage density from previous monitoring at the same site	Undertake an investigation to determine if the impacts are attributable to dewatering at the premises. Include details of the investigation in the Annual Environmental Report and if attributable to dewatering include an outline of corrective action taken or planned to mitigate adverse environmental impacts and management measures to prevent a recurrence of the event.
	EA2	A 2 point reduction in the health condition from the previous monitoring at the same site.	

Information

Records

31. All information and records required by the Licence must:

(a) be legible;

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

(c) except for records listed in 4.1.1(d), be retained for at least 6 years from the date the records were made or until the expiry of the Licence or any subsequent licence; and

(d) for those following records, be retained until the expiry of the Licence and any subsequent licence:

i. off-site environmental effects; or

ii. matters which affect the condition of the land or waters.

32. The Licence Holder must submit to the CEO within 90 days after the Anniversary Date, an Annual Audit Compliance Report indicating the extent to which the Licence Holder has complied with the Conditions in this Licence for the Annual Period.

33. The Licence Holder must implement a complaints management system that as a minimum records the number and details of complaints received concerning the environmental impact of the activities undertaken at the Premises and any action taken in response to the complaint.

Reporting

34. The Licence Holder must submit to the CEO an Annual Environmental Report by 30 November each year. The report must contain the information listed in Table 20 in the format or form specified in that table.

Table 20: Annual Environmental Report

Condition or table (if relevant)	Parameter	Format or form[1]
-	Summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period and any action taken	None specified
6	Water balance	None specified
Table 7	Monitoring of point source emissions to surface water results – Total Suspended Solids (Limit)	WR1
Table 10	Total Recoverable Hydrocarbon	LR1
	Loading of Total Nitrogen and Total Phosphorus	LR2
Table 11	Monitoring of point source emissions to surface water results – pH, Total Dissolved Solids, Nitrate and Nitrite Nitrogen, Total Kjeldahl, Total Nitrogen, Filterable Reactive Phosphorus, Total Phosphorus, Sodium, Magnesium, Zinc, Lead, Cadmium, Manganese, Chloride, Sulfate, Potassium, Cobalt, Iron, Nickel, Selenium, Mercury, Chromium (VI) and Total Chromium	WR2
Table 12	Monitoring of emissions to land	LR1
Table 13	Volume (cumulative) recycled for on-site irrigation	LR3
Table 13	Inert Waste Type 1, Inert Waste Type 2, Putrescible Waste and Clean Fill	None specified
Table 14	Process Monitoring: volume of tailings deposited and volume of water recovered.	None specified

Table 15	Downstream sites: pH, Total Suspended Solids, Total Dissolved Solids, Nitrate and Nitrite Nitrogen, Total Kjeldahl, Total Nitrogen, Filterable Reactive Phosphorus, Total Phosphorus, Sodium, Magnesium, Zinc, Lead, Cadmium, Manganese Chloride, Sulfate, Potassium, Cobalt, Iron, Nickel, Selenium, Mercury, Chromium (VI) and Total Chromium	WR3
	Background sites: pH, Total Suspended Solids, Total Dissolved Solids, Nitrate and Nitrite Nitrogen, Total Kjeldahl, Total Nitrogen, Filterable Reactive Phosphorus, Total Phosphorus, Sodium, Magnesium, Zinc, Lead, Cadmium, Manganese, Chloride, Sulfate, Potassium, Cobalt, Iron, Nickel, Selenium, Mercury, Chromium (VI) and Total Chromium, Chlorophyll-a and Phaeophytin	WR4
Table 16	Sediment - Chlorophyll-a and Phaeophytin	WR5
Table 17	Groundwater: Standing water level, pH, Total Dissolved Solids, Total Nitrogen, Arsenic, Copper, Molybdenum, Selenium, Uranium, Hexavalent Chromium	GR1
Table 18	Average foliage, health score and general environmental description	None specified
	Identical photographs of foliage density and shadow areas beneath trees	Photographs
Table 19	Management actions EA1 and EA2	None specified
32	Compliance	Annual Audit Compliance Report
33	Complaints summary	None specified

Note 1: Forms are in Schedule 3

35. The Licence Holder must ensure that the Annual Environmental Report also contains an assessment of the information contained within the report against previous monitoring results and Licence limits.

36. The Licence Holder must submit the information in Table 21 to the CEO according to the specifications in that table.

Table 21: Non-annual reporting requirements

Condition or table (if relevant)	Parameter	Reporting period	Reporting date (after end of the reporting period)	Format or form
-	Copies of original monitoring reports submitted to the Licence Holder by third parties	Not Applicable	Within 14 days ofthe CEOs request	As received by the Licence Holder from third parties

Notification

37. The Licence Holder must ensure that the parameters listed in Table 22 are notified to the CEO in accordance with the notification requirements of the table.

Table 22: Notification requirements

Condition or table (if relevant)	Parameter	Notification requirement[1]	Format or form[2]
-	Breach of any limit specified in the Licence	Part A: As soon as practicable but no later than 5pm of the next usual working day	N1
		Part B: As soon as practicable	
-	Recommencing start-up of operations (after a period of care and maintenance)	At least 21 days prior to recommencing production	None specified
9	Standing Water Level exceeding 6 mbgl	Within 7 calendar days of becoming aware of Standing Water Levels exceeding 6 mbgl	None specified
24	Calibration report	As soon as practicable	None specified

Note 1: Notification requirements in the Licence must not negate the requirement to comply with s72 of the Act
Note 2: Forms are in Schedule 3

Definitions

Term	Definition
ACN	Australian Company Number
Annual Audit Compliance Report (AACR)	means a report submitted in a format approved by the CEO (relevant guidelines and templates may be available on the Department's website).
Anniversary date	means 30 September of each year
annual period	a 12 month period commencing from 1 October until 30 September of the immediately following year.
ANZECC (2000)	the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000) produced by Australian and New Zealand Environment and Conservation Council and the Agricultural and Resources Management Council of Australia and New Zealand;
AS/NZS 2031'	Australian Standard AS/NZS 2031 *Selection of containers and preservation of water samples for microbiological analysis*
AS/NZS 5667.1	Australian Standard AS/NZS 5667.1 *Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples*
AS/NZS 5667.4	Australian Standard AS/NZS 5667.4 *Water Quality – Sampling – Guidance on sampling from lakes, natural and man-made*
AS/NZS 5667.6	Australian Standard AS/NZS 5667.6 *Water Quality – Sampling – Guidance on sampling of rivers and streams*
AS/NZS 5667.9	Australian Standard AS/NZS 5667.9 *Water Quality - Sampling Guidance on sampling from marine waters*
AS/NZS 5667.10	Australian Standard AS/NZS 5667.10 *Water Quality – Sampling – Guidance on sampling of waste waters*
AS/NZS 5667.11'	Australian Standard AS/NZS 5667.11 *Water Quality – Sampling – Guidance on sampling of groundwaters*
AS/NZS 5667.12'	Australian Standard AS/NZS 5667.12 *Water Quality – Sampling – Guidance on sampling of bottom sediments*
averaging period'	time over which a limit is measured or a monitoring result is obtained
bioremediation	the above-ground remediation of soils to reduce the concentrations of hydrocarbons through biodegradation. The process involves the stimulation of bacteria in the soil, which consume hydrocarbons as an energy source, releasing water and carbon dioxide as the ultimate breakdown products. This may include bioaugmentation of microbes to target specific contaminants
books	has the same meaning given to that term under the EP Act.

Term	Definition
CEO	means Chief Executive Officer of the Department. "submit to / notify the CEO" (or similar), means either: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 or: info@dwer.wa.gov.au
clean fill	has the meaning defined in Landfill Definitions
cfu/100mL	means colony-forming unit per one hundred millilitres
controlled waste'	has the definition in *Environmental Protection (Controlled Waste) Regulations 2004*
Department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
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.
environmentally hazardous material'	material (either solid or liquid raw materials, materials in the process of manufacture, manufactured products, products used in the manufacturing process, byproducts and waste) which if discharged into the environment from or within the premises may cause pollution or environmental harm. Note: Environmentally hazardous materials include dangerous goods where they are stored in quantities below placard quantities. The storage of dangerous goods above placard quantities is regulated by the DEMIRS.
Freeboard	means the distance between the maximum water surface elevations and the top of retaining banks or structures at their lowest point.
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
licence	refers to this document, which evidences the grant of a licence by the CEO under section 57 of the EP Act, subject to the specified conditions contained within.
licence holder	refers to the occupier of the premises, being the person specified on the front of the licence as the person to whom this licence has been granted.
monthly period	means a one-month period commencing from day 10 of a month until day 9 of the immediately following month.

Term	Definition
NATA	National Association of Testing Authorities, Australia
NATA accredited/accreditation	relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis
premises	refers to the premises to which this licence applies, as specified at the front of this licence and as shown on the premises map (Figure 1) in Schedule 1 to this licence.
prescribed premises	has the same meaning given to that term under the EP Act.
waste	has the same meaning given to that term under the EP Act.

Schedule 1: Maps

Figure 1 - Premises map

The Premises and key infrastructure is shown in the map below. The blue line depicts the Premises boundary.

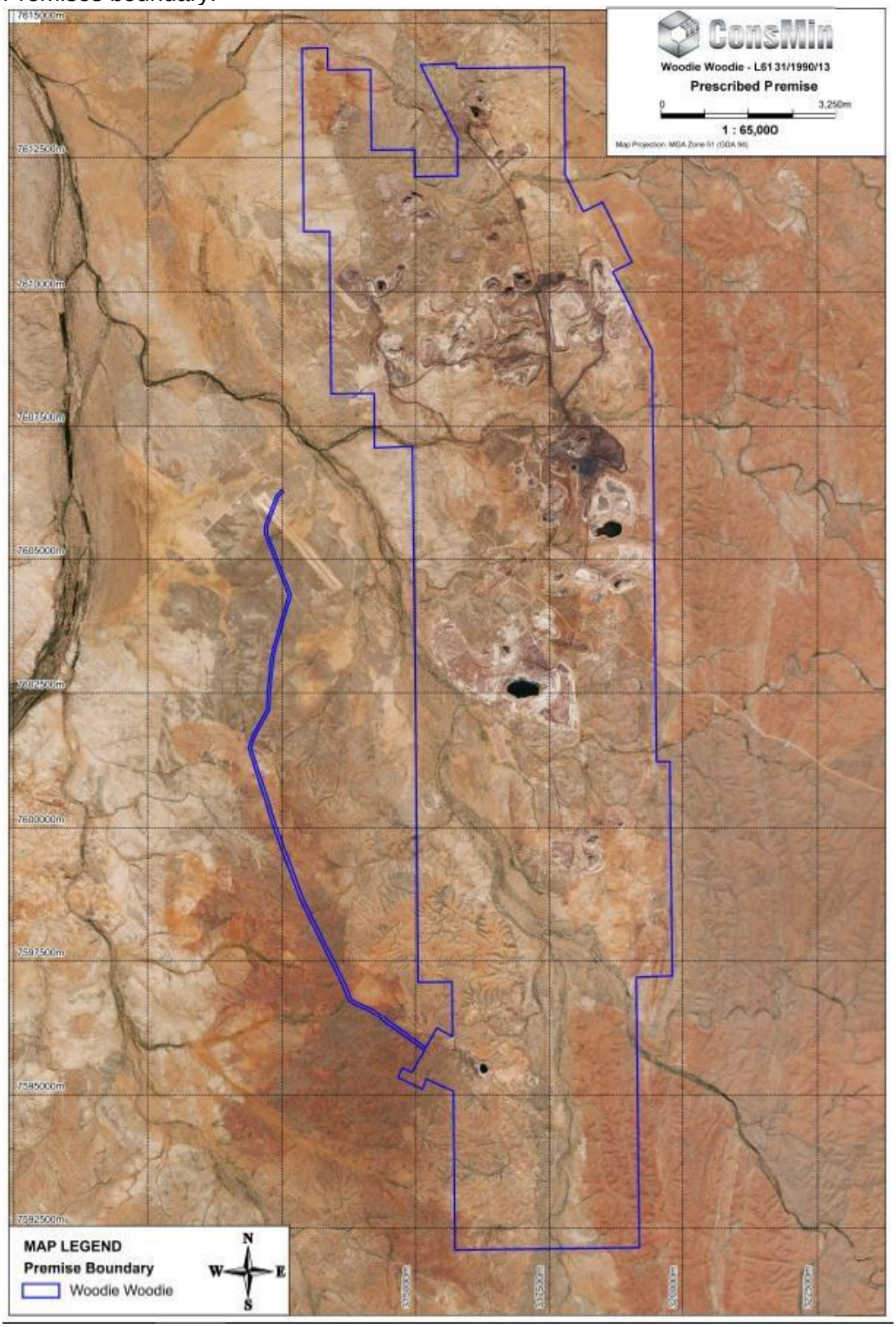


Figure 2 – Containment Infrastructure and Monitoring of Ambient Groundwater Quality

The locations of containment infrastructure as per Table 1 and monitoring of ambient groundwater quality as per Table 17.

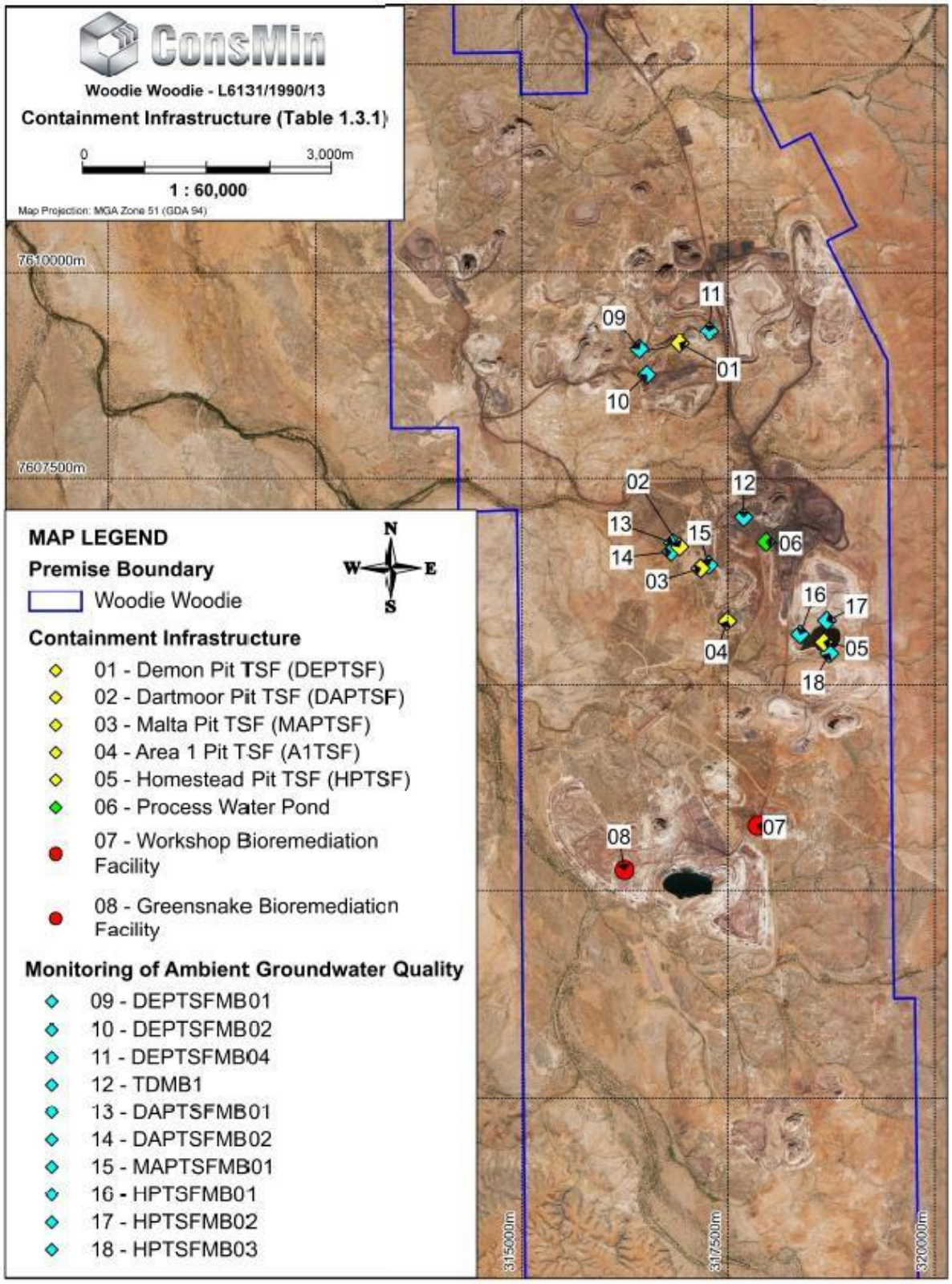


Figure 3 – Emission Points to Surface Water

The locations of emission points to surface water as per Table 7.

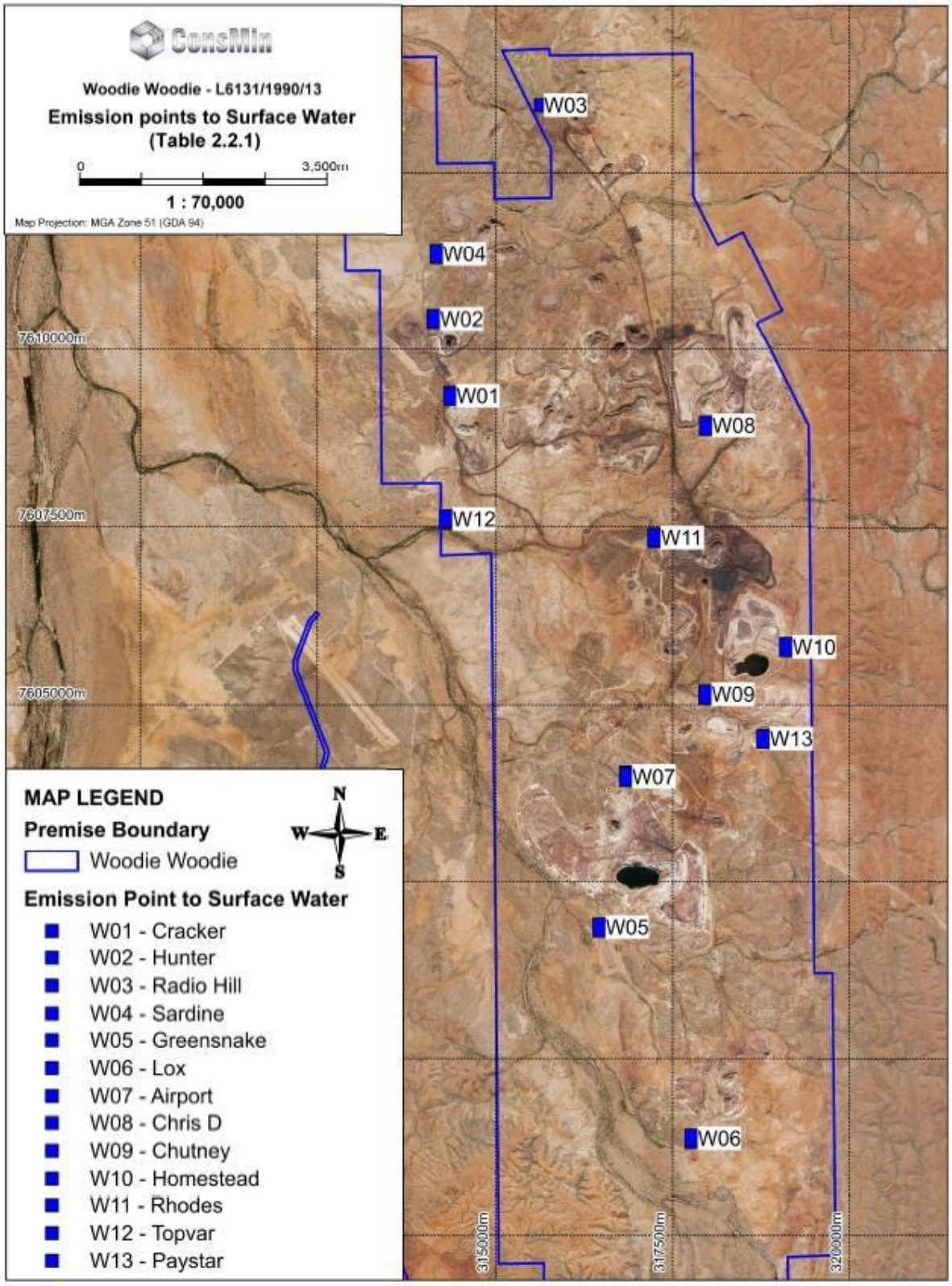


Figure 4 – Off-site Monitoring Locations

Off-site monitoring locations as per Table 15, 16 and 18.

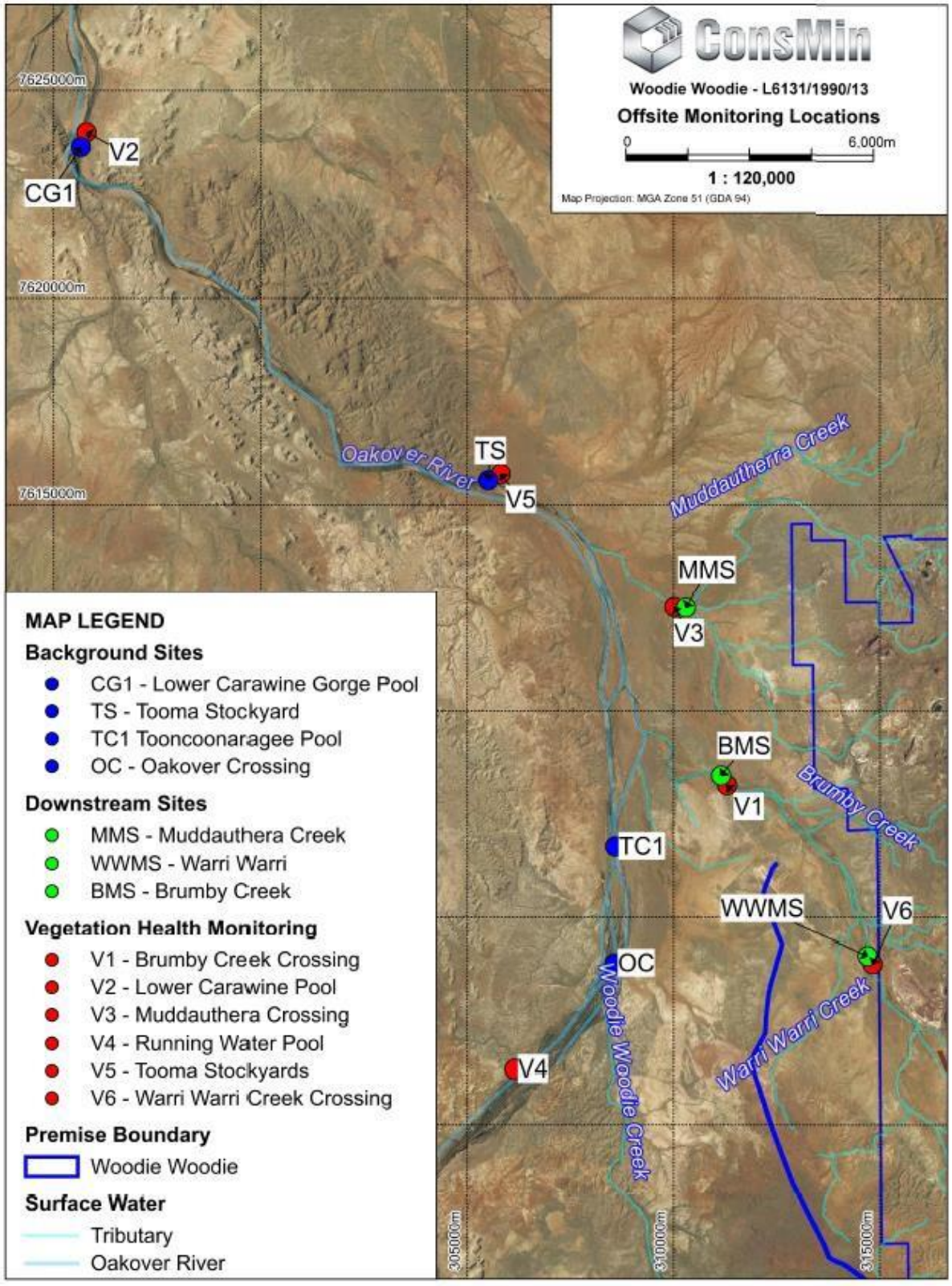


Figure 5 – Management of Waste

Waste management infrastructure as per Table 4 are shown below.

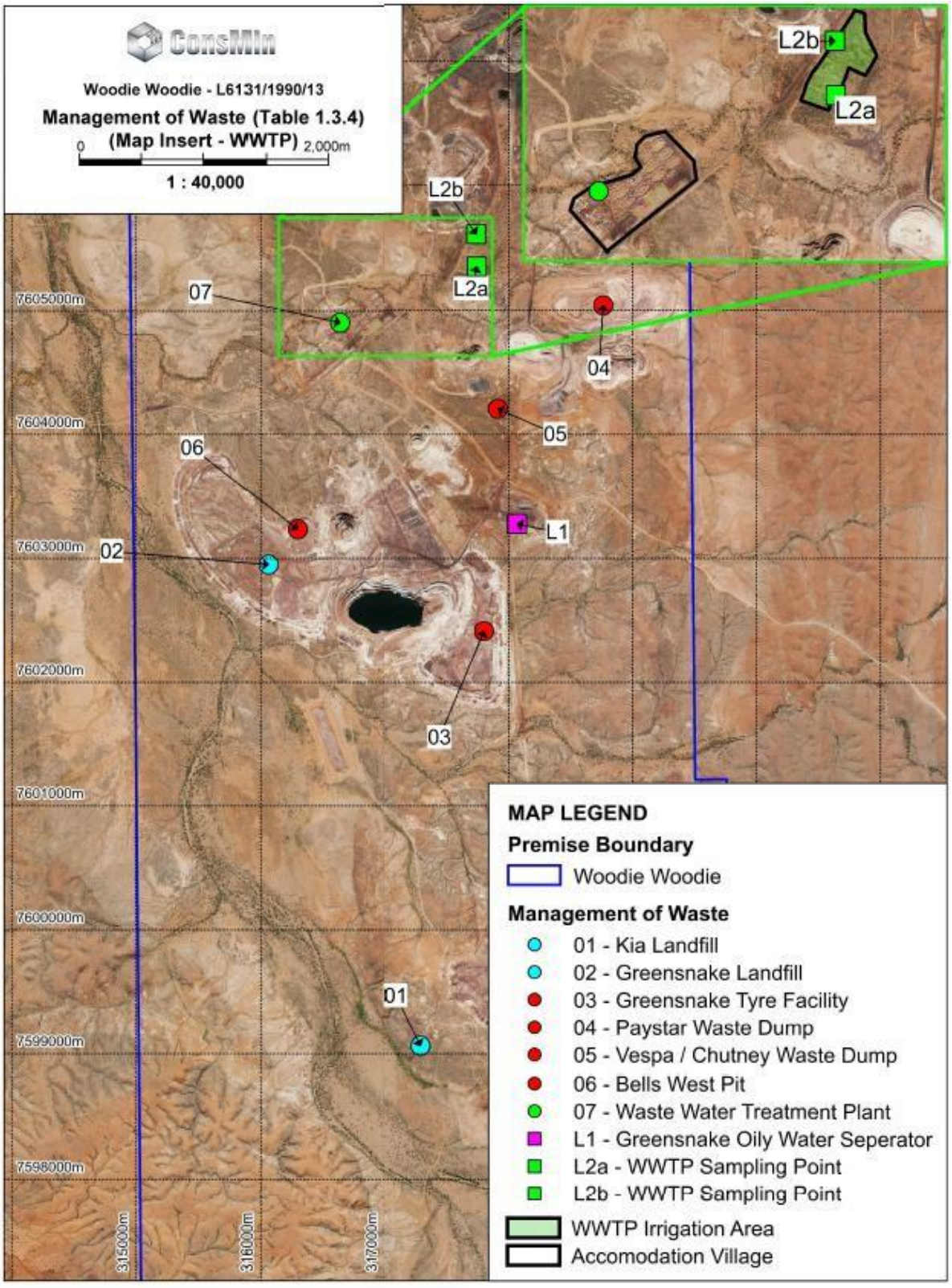


Figure 6 – Wastewater Treatment Plant Sampling Points

The locations of the monitoring points L2a and L2b defined in Table 9 are shown in the map below.

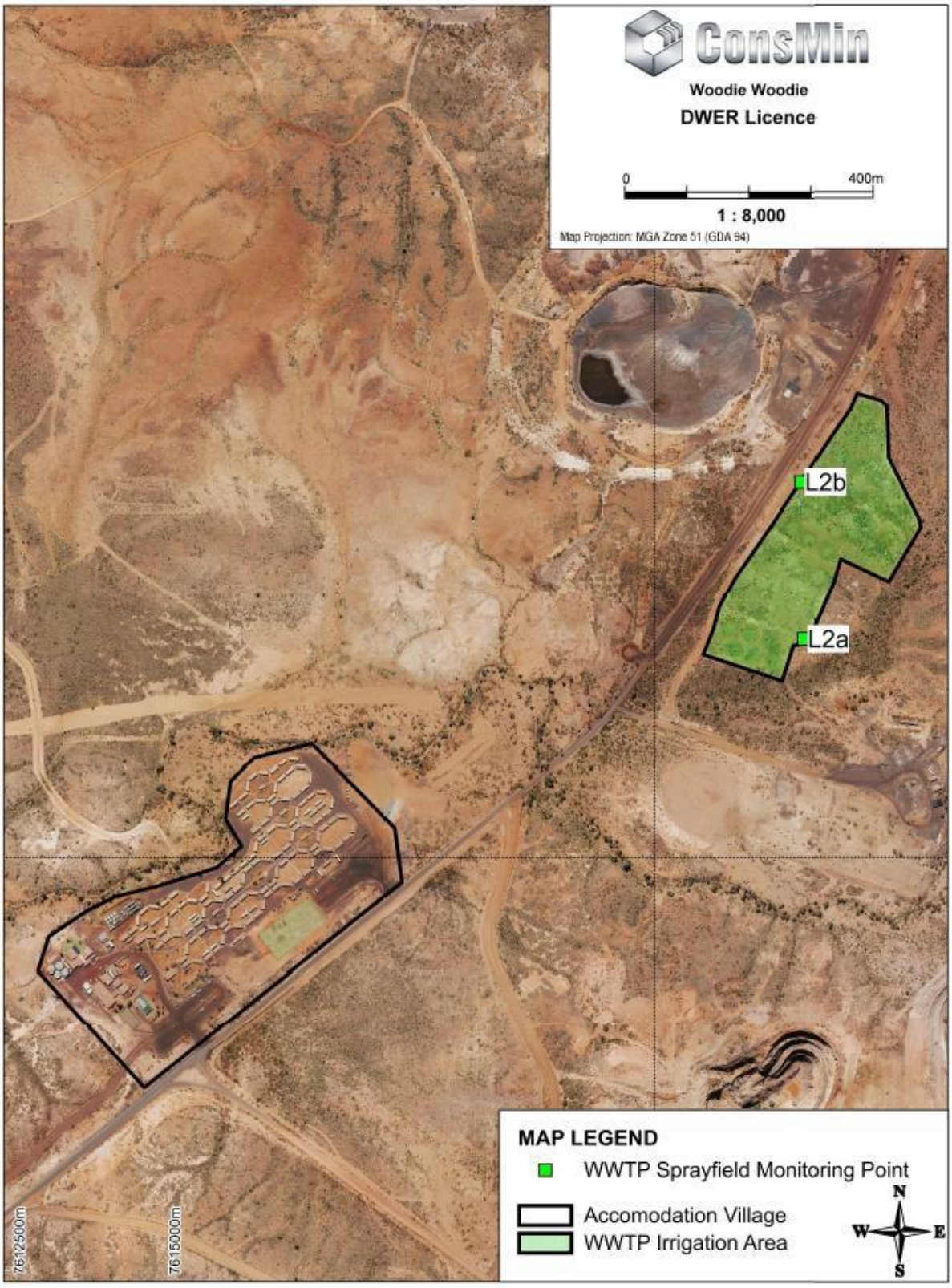
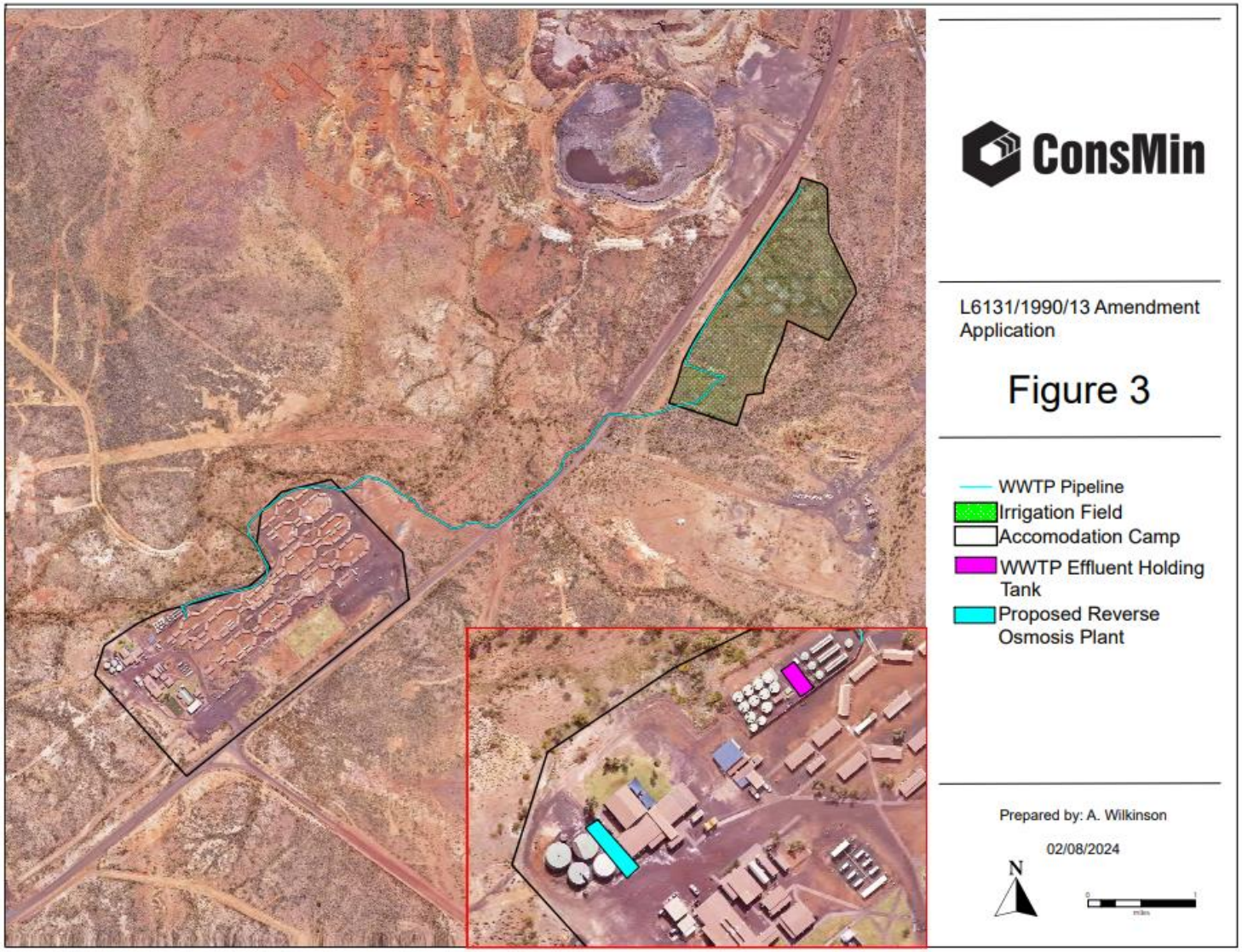


Figure 7 – Reverse Osmosis Plant to Irrigation Field



Schedule 3: Notification & Forms

Licence: L6131/1990/13
Form: WR1
Name: Monitoring of point source emissions to surface water

Licence Holder: Pilbara Manganese Pty Ltd
Period :

Form WR1: Monitoring of point source emissions to surface water							
Emission point	**Parameter**	**Limit**	**Unit**	**Result**	**Averaging period**	**Method**	**Sample date & times**
W1 – W12	Total Suspended Solids	80mg/L	m^3/day		Spot Sample		

Signed on behalf of Pilbara Manganese Pty Ltd: …….. Date: …….

Licence: L6131/1990/13 Licence Holder: Pilbara Manganese Pty Ltd
Form: WR2 Period:
Name: Monitoring of point source emissions to surface water

Form WR2: Monitoring of point source emissions to surface water						
Emission point	**Parameter**	**Units**	**Results**	**Averaging period**	**Method**	**Sample date & times**
W1 – W13	Volume (cumulative) dewatering water	m^3/day		Continuous		
	pH	pH units		Spot sample		
	Total Dissolved Solids	mg/L				
	Nitrate and Nitrite Nitrogen	mg/L				
	Total Kjeldahl Nitrogen	mg/L				
	Total Nitrogen	mg/L				
	Filterable Reactive Phosphorus	mg/L				
	Total Phosphorus	mg/L				
	Sodium	mg/L				
	Magnesium	mg/L				
	Zinc	mg/L				
	Lead	mg/L				
	Cadmium	mg/L				
	Manganese	mg/L				
	Chloride	mg/L				
	Sulfate	mg/L				

	Sodium	mg/L				
	Potassium	mg/L				
	Cobalt	mg/L				
	Iron	mg/L				
	Nickel	mg/L				
	Selenium	mg/L				
	Mercury	mg/L				
	Chromium (VI)	mg/L				
	Total Chromium	mg/L				

Signed on behalf of Pilbara Manganese Pty Ltd: …….. Date: …….

Licence: L6131/1990/13 Licence Holder: Pilbara Manganese Pty Ltd
Form: WR3 Period :
Name: Monitoring of ambient downstream surface water

Form WR3: Monitoring of surface water						
Emission point	**Parameter**	**Units**	**Result**	**Averaging period**	**Method**	**Sample date & times**
Downstream sites MMS, WWMS and BMS	pH	pH units		Spot sample		
	Total Dissolved Solids	mg/L				
	Total Suspended Solids	mg/L				
	Nitrate and Nitrite Nitrogen	mg/L				
	Total Kjeldahl	mg/L				
	Total Nitrogen	mg/L				
	Filterable Reactive Phosphorus	mg/L				
	Total Phosphorus	mg/L				
	Sodium	mg/L				
	Magnesium	mg/L				
	Zinc	mg/L				
	Lead	mg/L				
	Cadmium	mg/L				
	Manganese	mg/L				
	Chloride	mg/L				
	Sulfate	mg/L				

	Sodium	mg/L				
	Potassium	mg/L				
	Cobalt	mg/L				
	Iron	mg/L				
	Nickel	mg/L				
	Selenium	mg/L				
	Mercury	mg/L				
	Chromium (VI)	mg/L				
	Total Chromium	mg/L				

Signed on behalf of Pilbara Manganese Pty Ltd: …….. Date: ……

Licence: L6131/1990/13 Licence Holder: Pilbara Manganese Pty Ltd
Form: WR4 Period:
Name: Monitoring of ambient surface water

Form WR4: Monitoring of surface water						
Emission point	**Parameter**	**Units**	**Result**	**Averaging period**	**Method**	**Sample date & times**
Background sites CG1 TS TC1 OC	pH	pH units		Spot sample		
	Total Dissolved Solids	mg/L				
	Total Suspended Solids	mg/L				
	Nitrate and Nitrite Nitrogen	mg/L				
	Total Kjeldahl	mg/L				
	Total Nitrogen	mg/L				
	Filterable Reactive Phosphorus	mg/L				
	Total Phosphorus	mg/L				
	Sodium	mg/L				
	Magnesium	mg/L				
	Zinc[1]	mg/L				
	Lead[1]	mg/L				
	Cadmium[1]	mg/L				
	Manganese[1]	mg/L				
	Chloride	mg/L				
	Sulfate	mg/L				
	Sodium	mg/L				
	Potassium	mg/L				
	Cobalt	mg/L				
	Iron	mg/L				
	Nickel	mg/L				
	Selenium	mg/L				

Mercury	mg/L				
Chromium (VI)	mg/L				
Total Chromium	mg/L				
Chlorophyll-a	mg/L				
Phaeophytin	mg/L				

Note1: With adjustment for hardness as per ANZECC (2000) guidelines.

Signed on behalf of Pilbara Manganese Pty Ltd: …….. Date: …….

Licence: L6131/1990/13 Licence Holder: Pilbara Manganese Pty Ltd
Form: WR5 Period:
Name: Monitoring of ambient sediment quality

Form WR5: Monitoring of sediment quality						
Emission point	**Parameter**	**Units**	**Result**	**Averaging period**	**Method**	**Sample date & times**
Background sites CG1 TS TC1 OC	Chlorophyll-a	mg/m^2		Spot sample		
	Phaeophytin	mg/m^2				

Signed on behalf of Pilbara Manganese Pty Ltd: …….. **Date: ……**

Licence: L6131/1990/13 Licence Holder: Pilbara Manganese Pty Ltd
Form: GR1 Period :
Name: Monitoring of ambient groundwater

Form GR1: Monitoring of groundwater						
Emission point	**Parameter**	**Units**	**Results**	**Averaging period**	**Method**	**Sample date & times**
Demon Pit TSF DEPTSFMB01 DEPTSFMB02 DEPTSFMB04 **TSF2** TDMB1 **Dartmoor** DAPTSFMB01 DAPTSFMB02 **Malta** MAPTSFMB01 **Homestead TSF** HPTSFMB01 HPTSFMB02 HPTSFMB03	Standing water level	mbgl		Spot Sample		
	pH	pH units				
	Total Dissolved Solids	mg/L				
	Total Nitrogen	mg/L				
	Arsenic	mg/L				
	Copper	mg/L				
	Molybdenum	mg/L				
	Selenium	mg/L				
	Uranium	mg/L				
	Hexavalent Chromium	mg/L				

Signed on behalf of Pilbara Manganese Pty Ltd: …….. Date: …….

Licence: L6131/1990/13 Licence Holder: Pilbara Manganese Pty Ltd
Form: LR1 Period :
Name: Monitoring of emissions to land

Form LR1: Monitoring of emissions to land							
Emission point	**Parameter**	**Limit**	**Units**	**Results**	**Averaging period**	**Method**	**Sample date & times**
L1	Total Recoverable Hydrocarbon	15 mg/L	mg/L		Spot sample		

Signed on behalf of Pilbara Manganese Pty Ltd:…….. Date: …….

Licence: L6131/1990/13 Licence Holder: Pilbara Manganese Pty Ltd
Form: LR2 Period :
Name: Monitoring of emissions to land

Form LR1: Monitoring of emissions to land							
Emission point	**Parameter**	**Limit**	**Units**	**Results**	**Averaging period**	**Method**	**Sample date & times**
L2	Load of Total Nitrogen (TN)	480 kg/ha/year	kg/ha/year		Annually		
	Load of Total Phosphorus (TP)	120 kg/ha/year	kg/ha/year				
	Total Dissolved Solids (TDS)	2,000 mg/L	mg/L		Spot sample		

Signed on behalf of Pilbara Manganese Pty Ltd:…….. Date: ……..

Licence: L6131/1990/13 Licence Holder: Pilbara Manganese Pty Ltd
Form: LR3 Period :
Name: Monitoring of emissions to land

Form LR1: Monitoring of emissions to land						
Emission point	**Parameter**	**Units**	**Results**	**Averaging period**	**Method**	**Sample date & times**
L2	Volume (cumulative) recycled for on-site irrigation	m^3		Monthly		
	pH	pH units		Spot sample		
	Biochemical Oxygen Demand	mg/L				
	Total Suspended Solids	mg/L				
	Total Nitrogen	mg/L				
	Total Phosphorus	mg/L				
	E.coli	cfu/100mL				
	Total Dissolved Solids (TDS)	Mg/L				

Signed on behalf of Pilbara Manganese Pty Ltd:…….. Date: ……..

Licence: L6131/1990/13 Licence Holder: Pilbara Manganese Pty Ltd
Form: N1 Date of breach:

Notification of detection of the breach of a limit.

These pages outline the information that the operator must provide.
Units of measurement used in information supplied under Part A and B requirements must be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

Part A

Licence Number	
Name of operator	
Location of Premises	
Time and date of the detection	

Notification requirements for the breach of a limit	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Part B

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident.	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission.	
The dates of any previous N1 notifications for the Premises in the preceding 24 months.	

Name	
Post	
Signature on behalf of Pilbara Manganese Pty Ltd	
Date	