Robe Mesa Project

Groundwater Operating Strategy

Groundwater Abstraction from Bore PB13-3 for Mine Water Supply

Prepared for:

CZR Resources

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TABLE OF CONTENTS

Tables

Figures

DECLARATION

Name of Water Licence Applicant / Licensee	CZR Resources
Name of Development Project or Purpose	Robe Mesa Project
Legal description and Address of Land Where (a) water is to be taken, and (b) water is used (if different)	a) L08/303 b) M08/533, E08/1060 and E08/1686

Declaration:

"I understand that the commitments given in the attached operating strategy will be a condition of an associated water licence if approved and that non-compliance with a commitment or any licence condition may be a breach of the Rights in Water and Irrigation Act 1914".

Signatures

Person Legally Responsible for Water Licence _____

Printed Name _____

Date _____

Approved by Department of Water and Environmental Regulation Delegated Authority _____

Printed Name _____

Date _____

1. BACKGROUND

CZR Resources (CZR) proposes to develop the Robe Mesa Project (the Project), located approximately 25 km southeast of Yarraloola Homestead, and approximately 140 km southwest of Karratha in the Pilbara Region of Western Australia, between the Rio Tinto owned Mesa-A and Mesa-J iron ore mines. The Robe Mesa Project is a part of the Yarraloola Iron Ore Project, which is a joint venture between Zanthus Resources Ltd for CZR Resources (CZR, 85%) and ZanF Pty Ltd (15%).

The Robe Mesa Deposit is a Channel Iron Deposit (CID) ore-type and is hosted by two flat sheets of pisolitic ironstone (i.e. Robe Pisolite) that overlie each other. The Robe Mesa deposits are currently in the preliminary stages of development into an iron ore mine. Mining at Robe Mesa is currently focussed on the upper and lower CID, with proposed pits located above the water table. The project area is depicted on Figures 1.1 and 1.2 and show the1 Robe Mesa Deposit and the tenement area.

CZR recognises the Robe River Kuruma (RRK) People as the traditional owners of the land that Robe Mesa is located on, and the importance to the RRK People of leaving country as close as possible to the way that it was found. Working collaboratively, CZR and RRK signed the Robe Mesa Native Title Agreement on 21 December 2022 which includes a 'live' Cultural Heritage Management Plan to ensure the parties continue to work together to develop appropriate protection and management measures for the places it contains. CZR acknowledges that within the vicinity of the Robe Mesa Project there are many significant cultural places of great importance to RRK People, as shown on Figure 1.2. CZR recognises the cultural significance of water, in particular the importance of *Jajiwurra* (the Robe River) to the RRK people. CZR and RRK have agreed the Productive Mining area boundaries and identified No-Go-Areas which must not be entered or impacted by CZR. The area of the Robe Mesa that has been identified for Productive Mining provides for a set back from the mesa edge or buffer that must not be entered or impacted. Additionally, northern aspects of the Robe Mesa and other selected areas off the mesa, also contain No-Go-Areas.

The anticipated long-term (~7 years) mine water demand for the Robe Mesa project is estimated at 17 L/s (i.e. 540,000 kL/year) for construction, dust suppression, processing and camp requirements. It should be noted that the mining operation is not expecting any dewatering to be required, (i.e. the deposit is above the water table), to supplement the project's water demand. Therefore, the required project's water demand will need to be sourced from local groundwater. There are a few existing groundwater abstraction bores in the local area, but these are mostly shallow pastoral bores, capable of only limited abstraction rates and not suitable for mine water supply. The exception to these is the existing production bore PB13-3, drilled into the faulted/fractured Duck Creek Dolomite aquifer system, located approximately 8 km southeast from the proposed Robe Mesa mine, which has the potential to fully meet the site's water demand (Figure 1.2).

API Management Pty Ltd (API) holds a Department of Water and Environmental Regulation (DWER) 5C groundwater licence (GWL) 180637(3) to abstract groundwater from Pilbara Hamersley fractured rock aquifer on tenements E08/2089 and E09/2766-I for geotechnical investigation, mineral exploration and bore construction purposes, with an annual allocation of 95,000 kL (i.e. 3 L/s). Several drawpoints along these tenements have been drilled and are covered under this GWL, including bore PB13-3. CZR has recently acquired bore PB13-3 from API for mine water supply for the Robe Mesa project. Therefore, in order for CZR to abstract water from PB13-3, a separate 5C GWL application to abstract 17 L/s from the fractured aquifer (PB13-3) has been submitted to DWER for assessment. An H2 hydrogeological assessment report was prepared to assess the suitability of bore PB13-3 to sustain a long-term abstraction rate of 17 L/s and assess the potential impacts that this may have on other existing groundwater users and the environment (AQ2, 2023).

AQ2 was commissioned by CZR to prepare this Groundwater Licence Operating Strategy (GWOS) to meet DWER requirements to support CZR's 5C groundwater licence application.

The GWOS, presented in this report, has been prepared at the basic level of assessment in accordance with *DWER Operational Policy 5.08 use of operating strategies in the water licensing process (DWER, 2020)*.

CZR will be required to comply with the GWOS after 5C licence approval by DWER, and with any modifications to the GWOS that are made and approved during the term of the licence.

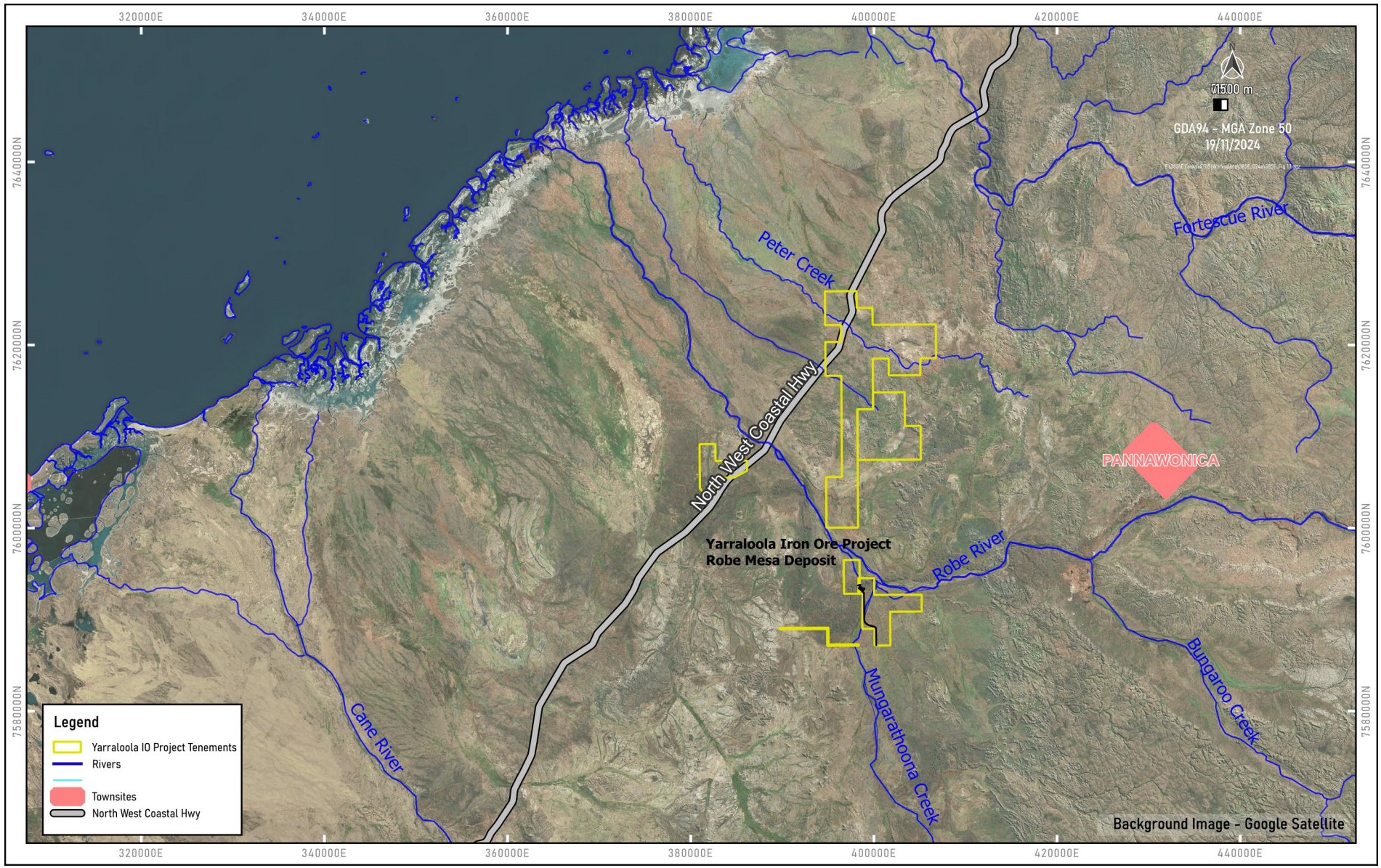

Figure 1.1 Regional Location of Robe Mesa Project

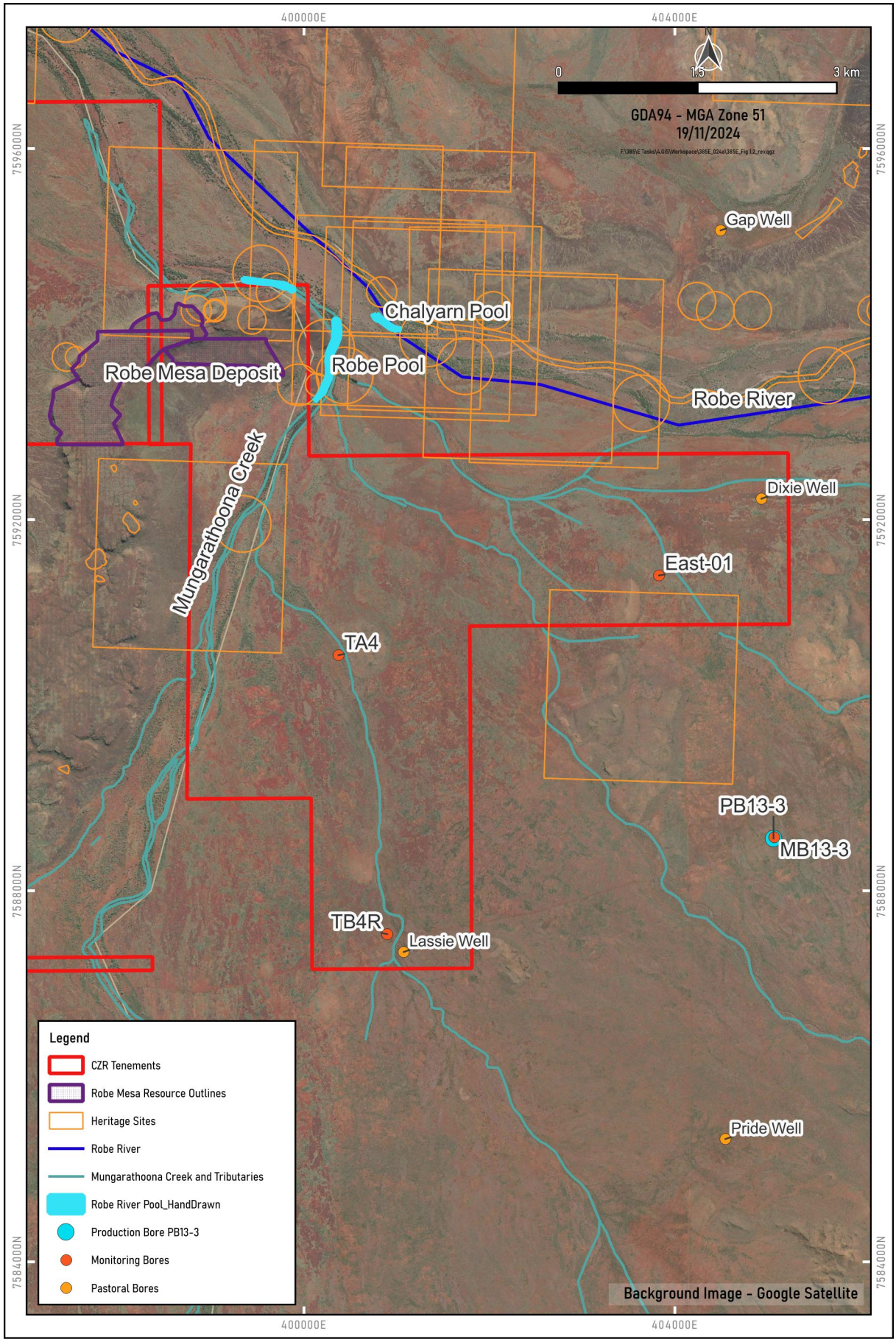

Figure 1.2 Robe Mesa Deposit and Bore PB13-3 Locations

2. ADMINISTRATIVE REQUIREMENTS

2.1 Existing Groundwater Licences

There are no other groundwater licences already issued by DWER that are relevant to this GWOS.

2.2 Staged Development of Water Licences

The groundwater licence does not involve a staged development.

2.3 Previous Investigations of Water Source and Environment

CZR has completed an H2 level of hydrogeological assessment (AQ2, 2023) for groundwater abstraction from bore PB13-3. This report covers hydrogeology, hydrology and environment, to assess the suitability of bore PB13-3 to sustain a long-term abstraction rate of 17 L/s (i.e. the project's water demand) and the potential effects that groundwater abstraction may have on the aquifer, the environment and other groundwater users.

2.4 Water Resource Management/Allocation Plan

The Project is located within the Ashburton sub-area of the Pilbara groundwater resource area. It is located within an area covered by the Pilbara groundwater allocation plan produced by DWER. However, there are no specific water resource allocation limits or management issues listed in this allocation plan that CZR should address in the GWOS.

2.5 Responsible Person/Position

Contact details for the CZR person/position responsible for implementation of the GWOS are listed in Table 1.

Table 1: Responsible Person/Position

Name	Stefan Murphy
Position	Managing Director
Phone Number	(08) 9468 2050
Postal Address	PO Box 16, West Perth WA 6872

2.6 Reporting Dates

The annual water year is defined as 1 January to 31 December.

The reporting dates of this GWOS will remain in line with the reporting dates required as per the conditions of GWL and are listed in Table 2.

Table 2: Reporting Dates

Item	Reporting Dates
Water use (metering) data	30 January annually
Annual - Groundwater Monitoring Summary (GMS)	31 March annually
Triennial - Groundwater Monitoring Review (GMR)	Every three years

Annual (GMS) and triennial (GMR) reports will follow the reporting structure detailed in *DWER Operational policy 5.12: Hydrogeological reporting associated with a groundwater well licence (DWER, 2009)*.

2.7 GWOS Duration

This GWOS will be effective for the life of the GWL, unless any changes are made by, or with the approval of, DWER.

2.8 GWOS Amendments and Review

Any changes to the conditions / commitments of the GWOS that are required during the period of the GWOS will be agreed by the licensee and DWER with the signatures of both parties on a GWOS Addendum.

This GWOS will be reviewed at least three months before the expiry date of the licence.

2.9 Breach of GWOS

Any reportable breach of this GWOS will be reported to DWER at the time of the breach and recorded in the annual report.

3. WATER SOURCE DESCRIPTION

3.1 Groundwater

As outlined in Section 1, the Robe Mesa mine will have a water demand of 17 L/s and this is likely to be entirely sourced from bore PB13-3. Data collected to-date during the drilling, bore construction and testing of the water supply bore PB13-3 has been documented by AQ2 (2023) and is summarised below.

Production Bore PB13-3 has been drilled into fault Breccia within the Duck Creek Dolomite. Groundwater flow through bedrock is expected to be via fractures and / or shear/fault zones, having enhanced permeability and storage and potentially forming a localised aquifer (i.e. fractured aquifer system). The main aquifer at PB13-3 is recharged by infiltration of rainfall and surface water flows. Recharge would be limited and seasonal (wet season).

Monitoring bore MB13-3 located approximately 15 m away from production bore PB13-3 is screened in fault Breccia and is considered suitable to efficiently monitor groundwater levels and water quality of the pumped aquifer (i.e. fractured bedrock aquifer system).

In addition, three monitoring bores are proposed to be included in the groundwater monitoring programme and are as follows:

- Existing monitoring bore TB4R – located approximately 4.2 km south-west of PB13-3 drilled and screened into the Ashburton Formation.
- Existing monitoring bore TA4 – located approximately 5 km north-west of PB13-3 drilled and screened in the Duck Creek Dolomite.
- Proposed monitoring bore East-01 – located approximately 3 km north of PB13-3, to be drilled and screened in the same fault zone as PB13-3.

Proposed groundwater monitoring bore locations are shown in Figure 7.1. Construction details for the bores are summarised in Table 3. It should be noted that the exact location, drilled depth and bore design for the proposed monitoring bore East-01 shall be determined during drilling operations.

Table 3: Bore Construction Details

Bore Name	Easting	Northing	Ground Level (mAHD)	Casing Material & Internal Diameter	Cased Depth (mbgl)	TOC PVC (magl)	Screen Depth (mbgl)	Static Water Level (mbTOC)	Static Water Level (mbgl)	Final Airlift Yield (L/s)
PB13-3	405066	7588562	115	PVC 200 mm	91.5	0.23	16.5 to 88.5	12.80 04/07/22	12.57 04/07/22	25
MB13-3	405074	7588576	115	PVC 50 mm	60.0	0.90	18 to 60	13.78 04/07/22	12.88 04/07/22	8.5
TB4R	400900	7587534	107	PVC 150 mm	95.0	TBC	11.0 to 95.0	6.54 15/08/23	TBC	NM
TA4	400362	7590559	102	PVC 150 mm	100.0	0.69	5.0 to 88.0	5.43 15/08/23	4.74 15/08/23	NM
Proposed East-01	403832	7591400	-	-	-	-	-	-	-	-

Note: coordinate projection is GDA94 Zone 50K, mAHD – metres above Australian Height Datum, mbgl – metres below ground level, TOC – top of casing, mbgl – metres below ground level, mbTOC – metres below top of casing, L/s – litres per second, TBC – to be confirmed, NM – not measured

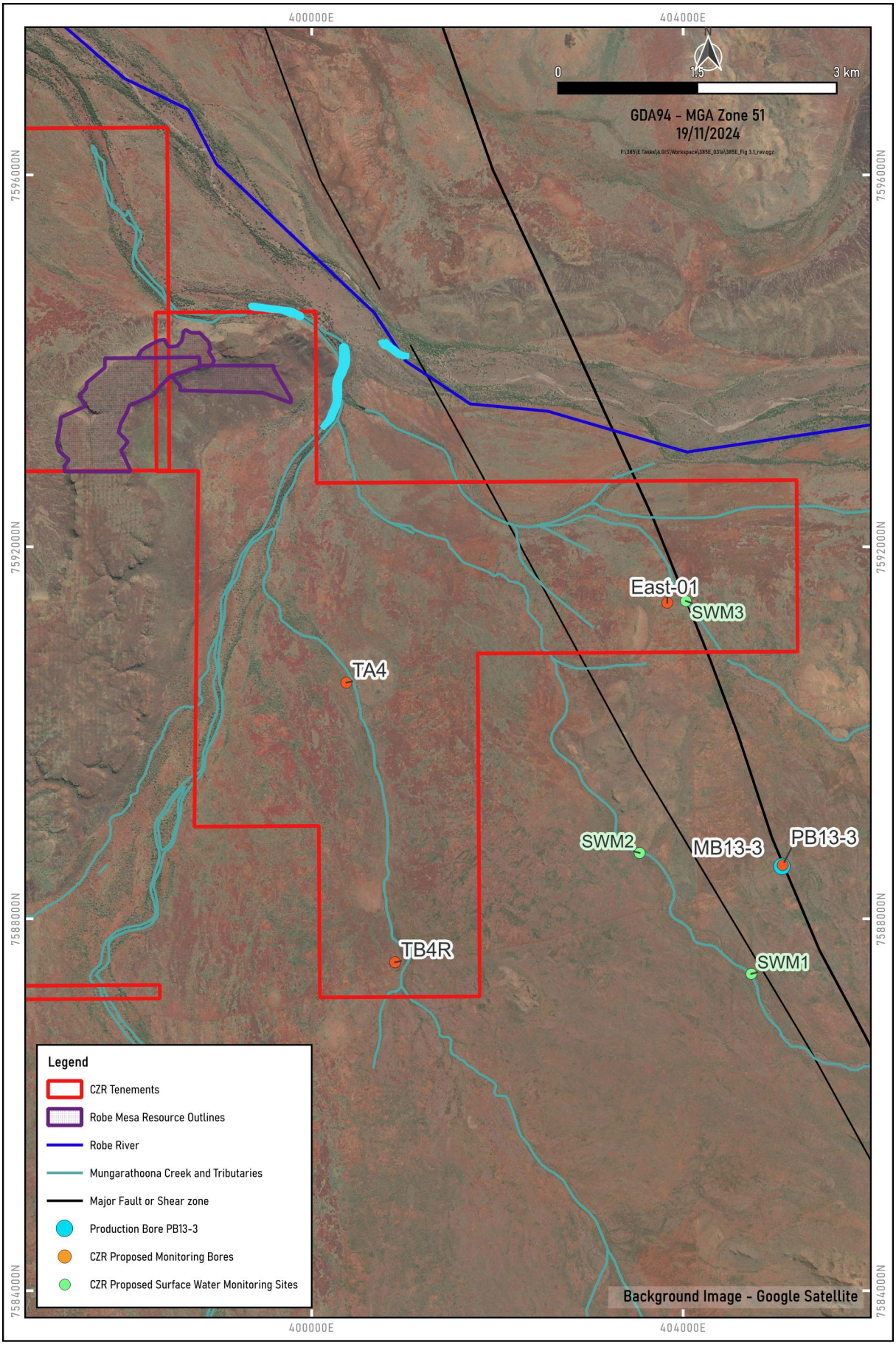

Figure 3.1 Proposed Groundwater and Surface Water Monitoring Network

3.2 Water Distribution Network

Production bore PB13-3 will supply water to both the mine process site and the mine village south of the mine. It is proposed that bore PB13-3 will be equipped with a submersible bore pump unit and generator, with water directly pumped to the collector pipe network (consisting of a bore spur pipeline and collector transfer pipeline) and final transfer to water storage tanks at the process plant and village.

4. IDENTIFYING AND MANAGING IMPACTS

A summary of the project's key issues relating to the proposed groundwater abstraction, their management objectives, measurements and responses is presented in Table 4.

These issues are to be managed if impacts are identified from the monitoring programs, which are outlined in the Contingency Plan in Section 8.

Table 4: Summary of Key Issues, Management Objectives and Management Responses

Potential Issue/Risk	Management Objective	Measurement	Management Response
Reliable water supply	Have supply of water to meet operational needs	Water meters to be installed and water levels will be measured	• Compare usage against water balance • Reduce demand for water (e.g. water efficiency measures) • Maximise water reuse • Located alternative water supply (e.g. construct new production bores(s) in the fractured bedrock aquifer/along north south fault zone)
Exceeding the groundwater licence allocation	Ensure that the licence allocation is not exceeded	Monthly collation of data of all flow meters to ensure volumes are within expected range	• Address the likely causes and impacts of increased abstraction, and inform DWER of any amendment to the licence that may be required
Other Groundwater Users	Ensure no impact on other groundwater users' water availability	Water levels measured in monitoring bore	• Assessment of water level trend to further determine impact • Increase monitoring (if needed) • Provide other users with additional water source (if needed)
Vegetation	Ensure that abstraction does not cause a detrimental impact on the health of natural vegetation	Water levels measured in monitoring bore Vegetation health monitoring	• Hydrogeologist and ecologist to review water abstraction/water level/vegetation health relationships.
Surface Water	Ensure that abstraction does not cause a detrimental impact on the surface water flows and water quality	Surface water monitoring at selected surface water monitoring sites	• Hydrogeologist and hydrologist to review groundwater abstraction/water level/water quality/ surface water flows and water quality relationship

Groundwater abstraction associated with the proposed water supply (~17 L/s) from bore PB13-3 is highly unlikely to have any adverse impacts on the local aquifers and the environment (groundwater dependent ecosystems (GDEs) and vegetation (GDVs)).

Based on the H2 assessment (AQ2, 2023), analytical modelling predicted that the maximum water changes (decline) are at their maximum in the vicinity of the production bore (i.e. drawdown up to 6.2 m and water level at approximately 20 mbgl after the 7-year mine life). The maximum distance that drawdown is predicted to extend (i.e. the distance where there is no lowering of water table or potentiometric surface) from pumping bore PB13-3 is up to 5.2 km along the fault/fracture zones (extending in a northwest direction) and less than 1.5 km in areas of no fracturing with a lower bulk permeability (across the fault zone). That is, the drawdown impacts of water supply pumping will be minimal and localised. Drawdown

will largely be confined to the fractured/faulted aquifer system, with minimal drawdown outside the fractured aquifer.

It is unlikely that the proposed abstraction from the fractured rock aquifer at bore PB13-3 will have adverse impacts on any nearby groundwater users, as there are no water supply bores within the maximum drawdown extent predicted in response to pumping from PB13-3 (up to 5.2 km). The closest licensed drawpoint is located approximately 5.8 km to the south of PB13-3. Additionally, none of the four stock bores located within a 5 km radius of PB13-3 are sited along the north south fault zone. The maximum drawdown extent of 1.5 km predicted across the fault zone (within the unfractured bedrock) does not reach the closest stock bore (i.e. Yallangi Well, located approximately 2.6 km to the east of PB13-3).

There are no known Groundwater Dependent Ecosystems GDEs within the predicted cone of depression, thus the proposed water supply abstraction from PB13-3 is highly unlikely to have any adverse impacts on any GDEs. Additionally, there are no known areas of phreatophytic vegetation within close proximity to production bore PB13-3, which could be affected by this abstraction. Local vegetation identified within the Project area obtain water from soil moisture in the unsaturated zone above the water table, and are likely to rely on sporadic rainfall and overland water flow events, with no association with groundwater (i.e. phreatophytic vegetation). Additionally, the groundwater table at PB13-3 is around 12 to 14 mbgl

As outlined in the H2 Assessment report (AQ2, 2023), creeks in the vicinity of water supply bore PB13-3 are ephemeral with runoff responding to sporadic significant rainfall events. The closest creek is located approximately 1.2 km to the west from PB13-3 and the creek bed elevation is at approximately 111 mAHD, with the groundwater level being about 8 to 10 m below the creek bed elevation (i.e 101 to 103 mAHD). This indicates that local groundwater and surface water systems are not in direct hydraulic connection (the water table is below the base of the local creek beds). As such, under normal conditions, there will be no groundwater baseflow to the creek during or after the wet season. Therefore, any unidentified pools on this creek are highly likely to be totally dependent upon surface water flows alone. It is noted that it might be possible for groundwater levels to rise closer to the surface in low lying areas during and following extreme rainfall events (e.g. cyclones), due to higher than normal recharge. However, at such times, flow within the local creeks would be dominated by surface water runoff, with a minimal contribution from the groundwater. CZR recognises the cultural significance of water, in particular the importance of *Jajiwurra* (the Robe River) to the RRK people. Therefore, the cultural heritage values associated with surface water have been included in this GWOS (including management, monitoring and contingency strategies).

5. OPERATING RULES

5.1 Recommended Operating Rules

During the operational period, CZR is committed to the following:

- CZR will not exceed the maximum water draw of 540,000 kL/year (17 L/s) from the local fractured rock aquifer system for the purposes of water supply.
- The volume of water taken from the individual water supply source (via bore(s)), will be metered using suitable flow meters, that will be installed in accordance with the provisions of the document "Guidelines for water meter installation" (DWER, 2009). The measuring accuracy of the installed meters will be maintained within plus or minus 5% of the volume metered, in field conditions.
- Production bore PB13-3 (used for water supply) will be equipped with an electric submersible pump with suitable operational protection (e.g. low-flow and high-temperature cut-off switch).
- The production bore will be operated according to water demand, with no set schedule.
- Recommended pumping rates for any new production bores will be determined following installation and test pumping.
- The individual bore pumping rates may be optimised over time, based on ongoing bore and aquifer performance review.

5.2 Specific Operating Rules

The predicted drawdowns do not extend to any other groundwater user or identified environmental receptor. As such, there are no other, specific operating rules developed related to potential impacts of abstraction from bore PB13-3.

6. MONITORING

6.1 Purpose of the Groundwater Monitoring Programme

The purpose of the groundwater monitoring programme is to ensure:

- The abstraction is within the licence limits.
- Reliable water supply is available to meet the project's operational needs.
- Pumping does not impact other groundwater users.
- Abstraction does not cause a detrimental impact on the GDEs and the health of natural vegetation.

Results of the monitoring programme are to be included in CZR's annual GMS and triennial GMR reports.

CZR will ensure that the schedule of production and monitoring bores will be kept up to date and DWER will be notified of any bore alterations or additions that are made. As new bores are installed, they will be included in the groundwater monitoring programme.

6.2 Water Use Measurement

A totalising (cumulative) in-line flow meter will be installed at production bore PB13-3 and should be read monthly. The proposed water use measurement monitoring programme is given in Table 5.

Table 5: Water Use Measurement Monitoring Programme

Monitoring Purpose	Draw Point ID	Description of Meter Installed (Make, Serial No., Installation Date)	Meter Maintenance/ Calibration Schedule	Frequency of Recording Meter Data
Water supply abstraction	Operational Production Bore PB13-3	Reported to DWER via Form 8 submission	Maintenance – Annually Calibration – As required	Monthly

The details of the flow meter will be provided to DWER via Form 8 submission, when available.

The water meter will be inspected regularly for faults. Maintenance will be undertaken as required and calibration will be carried out according to the manufacturer's specifications. Details of any significant meter maintenance and replacement will be collated throughout the water year and incorporated into the annual monitoring summary.

6.3 Groudwater Level Monitoring

Groundwater level monitoring will be conducted on a monthly basis in production bore PB13-3 and four monitoring bores MB13-3, TA4, TB4R and proposed East-01. A note will be made as to whether the production bore is pumping or not at the time of the manual measurement.

The water level monitoring programme is listed in Table 6.

Field equipment used for water level readings will be well maintained and checked before each use and according to manufacturers' recommendations.

Table 6: Groundwater Level Monitoring Programme

Bore Type	Data Requirement	Frequency
Active Production Bore PB13-3	Water levels	Monthly
Monitoring Bores MB13-3, TA4, TB4R and proposed East-01	Water levels	Monthly

6.4 Groundwater Quality Monitoring

Water samples will be collected bi-annually (six monthly) from the operational production bore PB13-3 and three monitoring bores TA4, TB4R and proposed East-01, for field measurement of pH and electrical conductivity (EC) and collected annually for full chemical analysis (a Comprehensive Suite) by a reputable NATA-accredited laboratory.

Field test analysis methods shall be conducted in accordance with the equipment manufacturer instructions. The calibration of field pH/EC meters shall be conducted each time prior to sampling in accordance with manufacturer's instructions.

All methods and equipment used in water quality sampling should be undertaken in accordance with the Australian Standard AS/NZS 5667 (1998).

The programme to monitor water quality is given in Table 7.

Table 7: Proposed Groundwater Quality Monitoring Programme

Monitoring Site Type	Monitoring Frequency	Parameters	
Production Bore PB13-3 (active) and Monitoring Bores TA4, TB4R and proposed East-01	Bi-annually (field)	Field: • pH • EC	
	Annually (lab)	Laboratory: • pH • Conductivity (EC) • Total Dissolved Solids (TDS) • Total Hardness (as $CaCO_3$) • Total Alkalinity (as $CaCO_3$) • Carbonate (CO_3) • Bicarbonate (HCO_3) • Calcium (Ca) • Potassium (K) • Magnesium (Mg) • Sodium (Na) • Ammonia (NH_3)	• Phosphate (PO_4) • Chloride (Cl) • Sulphate (SO_4) • Nitrate (NO_3) • Silica (SiO_2) • Aluminium (Al) • Iron (Fe) • Manganese (Mn) • Arsenic (As) • Cadmium (Cd) • Chromium (Cr) • Lead (Pb) • Mercury (Hg) • Selenium (Se) • Zinc (Zn).

6.5 Surface Water Monitoring

The purpose of the surface water monitoring programme is to ensure abstraction from PB13-3 does not cause a detrimental impact on surface water flows and water quality. As outlined in Section 4, surface water has environmental and cultural heritage values.

6.5.1 Surface Water Monitoring Stite Locations

Three surface water monitoring sites are recommended to be developed at the locations shown in Figure 3.1 and are summarised in Table 8.

Table 8: Proposed Surface Water Monitoring Sites

Monitoring Site ID	Eastings	Northings	Measurement	Purpose
SWM1	404740	7587400	Water quality and flow rates	Monitoring point located on the closest creek to PB13-3 and upstream of production bore PB13-3
SWM2	403530	7588710		Monitoring point located on the closest creek to PB13-3 and downstream of production bore PB13-3
SWM3	404030	7591420		Monitoring point located on the small creek along the major fault line and downstream of production bore PB13-3

Note: coordinate projection is GDA94 Zone 50K

It should be noted that the exact locations and design for the proposed surface water monitoring sites shall be determined during the surface water monitoring site installation programme.

CZR will ensure that the schedule of surface water monitoring sites will be kept up to date and DWER will be notified of any site alterations or additions that are made. As surface water sites are installed, they will be included in the surface water monitoring programme.

Additionally, it is recommended that a weather station be installed at the site to collect local rainfall data which can be used in conjunction with stream gauging data to better understand the relationship between rainfall and runoff/spring flow.

6.5.2 Surface Water Monitoring Regime

The proposed monitoring regime from the surface water monitoring sites is as follows:

- Water level - automatically recorded by pressure sensors and stored on data loggers. Indicatively, measured at 10-minute increments.
- Water quality - collect quarterly samples where surface water is available for collection.

Water samples should be analysed for full chemical analysis (as per list in Table 9) by a reputable NATA-accredited laboratory.

Results of the surface water monitoring programme are to be included in CZR's annual GMS and triennial GMR reports.

Table 9: Proposed Surface Water Quality Monitoring Programme

Monitoring Site Type	Monitoring Frequency	Parameters	
Surface Water Sites: SWM1, SWM2, SWM3	Quarterly (field)	Field: • pH • EC	
	Quarterly (lab)	Laboratory: • pH • Conductivity (EC) • Total Dissolved Solids (TDS) • Total Suspended Solid (TSS) • Turbidity • Total acidity • Total Alkalinity (as $CaCO_3$) • Carbonate (CO_3) • Bicarbonate (HCO_3) • Calcium (Ca) • Potassium (K) • Magnesium (Mg) • Sodium (Na) • Ammonia (NH_3)	• Phosphate (PO_4) • Chloride (Cl) • Sulphate (SO_4) • Nitrate (NO_3) • Silica (SiO_2) • Aluminium (Al) • Iron (Fe) • Manganese (Mn) • Arsenic (As) • Cadmium (Cd) • Chromium (Cr) • Lead (Pb) • Mercury (Hg) • Selenium (Se) • Zinc (Zn).

7. CONTINGENCY PROGRAMME

A number of potential impacts from water abstraction have been identified along with management approaches for minimising them, which were presented in Table 4 (Section 5). Further actions may be required to be taken if the management response is not effective in limiting any detrimental impact/circumstances and these are listed in Table 10.

Table 10: Contingency Programme

Potential Issue/Risk	Consequences	Contingency Programme
Reliable water supply	• Mechanical bore breakdown • Insufficient yield	• Reduce water demand • Install replacement pumps • Drill additional water supply bores
Exceeding the groundwater licence allocation	Unexpected aquifer response (aquifer stress)	• Increase monitoring to evaluate response • Present results of investigation to DWER within 30 days
Water meter breaks down	Failure to submit required water use data	• Regular checks/ maintenance to be carried out to ensure water meter are in working order • Back up parts kept on site • Replace /fix meter • Ensure prompt communication with DWER
Non-compliance with GWOS commitments	Non-compliance with licence conditions	• CZR will ensure there is always a member of staff available who is capable of monitoring the compliance with GWOS commitments
Other Groundwater Users	Water level decline from abstraction may impact other users' bores	• Reduce abstraction rate • If reduction of other users' water supply is due to PB13-3 abstraction, 'making good' supplies to other users will be provided (e.g. providing access to an alternative source of water of similar quality and quantity to meet usage requirements, dam supplementation etc.)
Vegetation health	Water level decline from abstraction may impact vegetation	• Further investigation required. • Present results of investigation to DWER with 90 days
Surface water	Water level decline from abstraction may impact surface water flows and water quality. Surface water has environmental and cultural heritage values.	• Further investigation required. • Present results of investigation to DWER with 90 days

8. WATER USE EFFICIENCY

CZR will make every effort to maximise water recycling and to minimise water use. Water will not be intentionally discharged off-site when it can be used for any other purpose.

The delivery system for groundwater pumped will be designed to minimise the likelihood of uncontrolled water loss. Visual inspections of bore headworks, water pipelines and water storage facilities will be carried out when necessary to ensure that potential leaks are identified and corrected efficiently as soon as possible.

The application of water for dust suppression will be carefully controlled to prevent runoff or overspray.

CZR will continually attempt to improve water use efficiency as part of the ongoing water management programme.

9. SUMMARY OF COMMITMENTS

The monitoring and other commitments proposed in this GWOS are summarised in Table 11.

Table 11: Summary List of Commitments

Commitment	Due Date
Any major changes that are required during the period of the GWOS must be agreed by the licensee and DWER with the signatures of both parties on an Operating Strategy Addendum.	Ongoing
DWER will be notified in the event that a breach of the GWOS occurs. The GWOS will be re-submitted to DWER for review three months before the expiry date of the strategy.	Ongoing
Submit to DWER a Groundwater Monitoring Summary (GMS) report prepared each year, covering monitoring data recorded during the water year from 1 January to 31 December	By 31 March each year
Submit to DWER a Groundwater Monitoring review (GMR) report prepared every three years	By 31 March each year
GMS and GMR reports will be prepared in accordance with Operational policy 5.12 'Hydrogeological reporting associated with a groundwater well licence'	Ongoing
GMS and GMR reports will include details of any missing data and what action will be taken to rectify the situation	Ongoing
Submit to Water Online total annual abstraction figures for the water year (1 January to 31 December) by 31 March each year.	By 31 March each year
Monitoring as specified in Tables 6, 7 and 9 of this GWOS will be undertaken	Ongoing
CZR will ensure that the schedule of production and a table of monitoring bore details will be kept up to date.	Ongoing
The abstraction shall not exceed the annual allocation of 540,000 kL (17 L/s) from the local fractured rock aquifer systems	Ongoing
A totalising flow meter will be installed at each production bore to measure abstraction volumes.	Ongoing
The volume of water taken under the groundwater licence (from the production bore) will be metered using suitable flow meter to meet licence requirements, that will be installed in accordance with the provisions of the document "Guidelines for water meter installation" (DWER, 2009). The installed meters accuracy will be maintained within plus or minus 5% of the volume metered, in field conditions.	Ongoing
If any of the issues identified in Table 4 arise, the contingency actions described in Section 7 (Table 10) of this GWOS will be undertaken	Ongoing
CZR will aim to improve water use efficiency as part of the water management programme.	Ongoing
The delivery system for groundwater pumped will be designed using best practice methods to minimise the likelihood of uncontrolled water loss.	Ongoing

10. REFERENCES

AQ2, 2023. Robe Mesa Project: H2 Level of Assessment, Groundwater Abstraction from Bore PB13-3 for Mine Water Supply. Unpublished report prepared for CZR Resources

DWER, 2009. Operational Policy no. 5.12 – Hydrogeological reporting associated with a groundwater well licence: DWER, Perth, November 2009

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DWER, 2013. Pilbara Groundwater Allocation Plan. Report no 55. DWER, October 2013.