

Warrego Energy Pty Ltd
West Erregulla-2 Exploration Well
Environment Plan Summary
13 April 2017



When you
think with a
global mind
problems
get smaller

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West Erregulla-2 Exploration Well

Prepared for
Warrego Energy Pty Ltd

Note: this document has been produced by Warrego Energy Pty Ltd based on work previously undertaken by Coffey Services Australia Pty Ltd.

Original document prepared by
Coffey Services Australia Pty Ltd
Suite 2, 53 Burswood Road
Burswood WA 6100 Australia
t: +61 8 9269 6200 f: +61 8 9269 6299
ABN: 55 139 460 521

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1. Introduction

1.1. Project outline

Warrego Energy Pty Ltd (Warrego Energy), Operator of Exploration Permit EP 469, plans to drill the West Erregulla-2 exploration well (this or the project) within Exploration Permit EP 469. The Permit is located approximately 50 km southeast of Dongara and 230 km north of Perth (Figure 1.1).

The West Erregulla tight gas field was discovered in 1990 by exploration well West Erregulla-1. The field has been independently assessed to contain significant volumes of gas, which Warrego Energy intends to recover through innovative drilling and production techniques. A secondary target of West Erregulla – 2 is the deeper conventional Permian age Kingia sandstone, believed equivalent to the nearby Waitsia field, recently discovered by AWE.

The intent of West Erregulla-2 is to intersect Permian Wagina and Dongara sandstones in the West Erregulla field, and the deeper Kingia sandstone. These structures will be evaluated for the presence of hydrocarbons and future well operations such as well testing will then be planned and implemented. This project follows the West Erregulla 3D seismic survey undertaken in December 2014. It aims to further explore potential hydrocarbon-bearing rock strata to support future drilling and production activities. This environmental plan (EP) is for the drilling of the well only. Further well operations such as well testing will happen at a later date. This EP will then be updated and approved by the Department of Mines and Petroleum (DMP) before any further activities happen.

The proximity of West Erregulla to existing gas export infrastructure (i.e. the Dampier-Bunbury and Parmelia pipelines) provides economic advantages for the development of the field.

1.2. Objectives of this document

This environmental plan (EP) is required under the *Petroleum and Geothermal Energy Resources Act 1967* (PGER Act) and the *Petroleum and Geothermal Energy Resources (Environment) Regulations 2012* (PGER (E) Regulations). The EP has been prepared according to the *Guideline for the Development of Petroleum and Geothermal Environment Plans in Western Australia* (DMP, 2016a). This EP is also intended to provide Warrego Energy with a practical environmental performance management tool for the project.

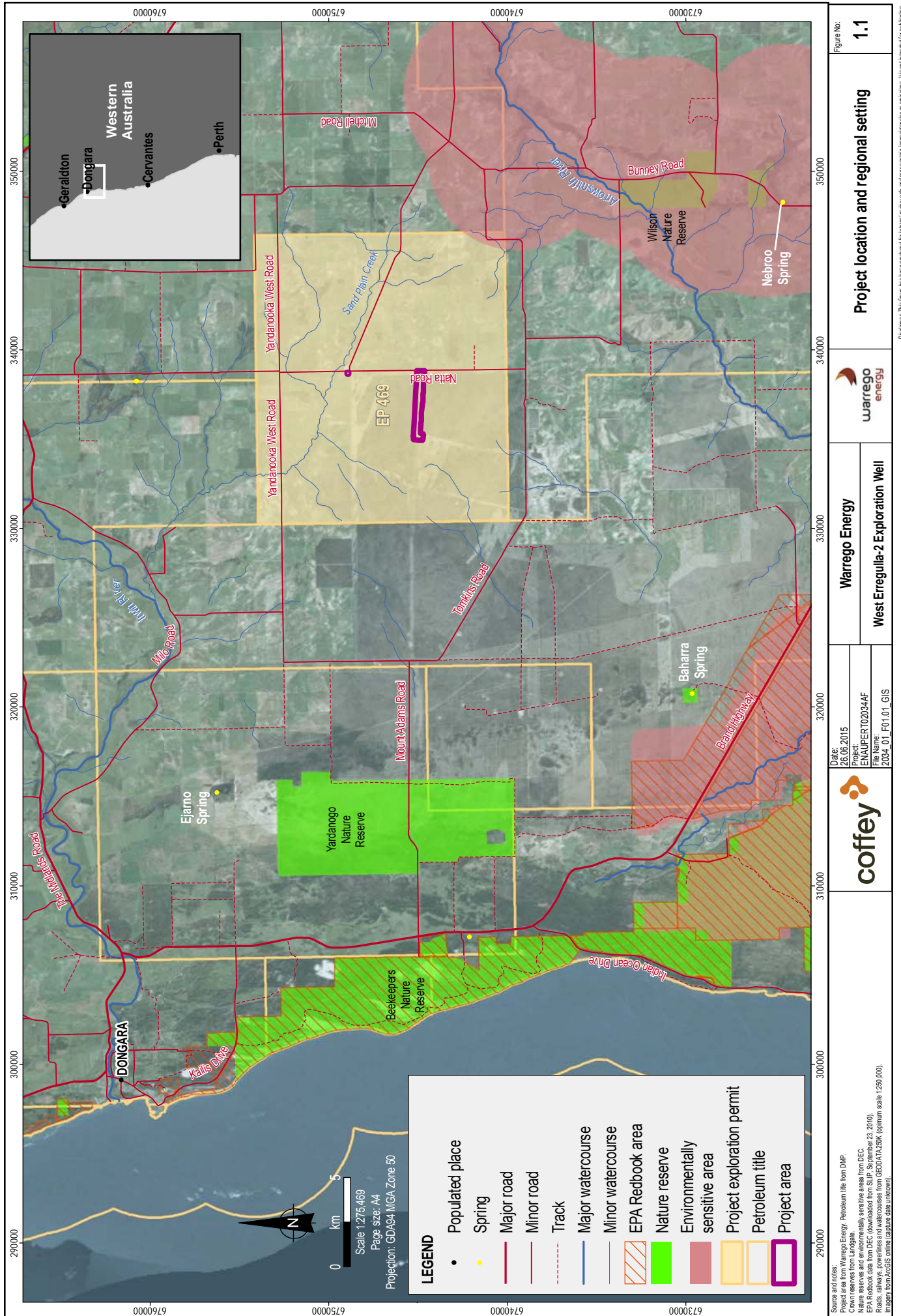
The objectives of this EP are to:

- demonstrate compliance with relevant legislation;
- demonstrate that Warrego Energy has a clear understanding of how the project will interact with the environment;
- demonstrate that environmental effects and risks are managed to as low as reasonably practicable (ALARP);
- demonstrate that Warrego Energy has set appropriate performance objectives, standards and measurement criteria; and
- ensure that systems are in place to minimise the environmental effects associated with the project.

Any future exploration, appraisal or development activities (unrelated to the preparation for, and implementation of, the project) do not form part of this EP.

Figure

1.1 Project location and regional setting



		Project location and regional setting Figure No: 1.1	
Warrego Energy West Erregulla-2 Exploration Well		Date: 26.06.2015 Project: ENVALPER02034F File Name: 2024_01_F01.01_GIS	
		Source and notes: Project area from Warrego Energy. Petroleum title from DMP. Nature reserves and environmentally sensitive areas from DEC. EPA Redbook data from DEC (downloaded from SLIP, September 23, 2010). Roads, railways, powerlines and watercourses from GEODATA25K (optimum scale: 1:250,000). Imagery from ArcGIS online (capture date unknown).	

Disclaimer: This figure has been produced for internal use only and may contain inaccuracies or omissions. It is not intended for publication.

1.3. Parties

1.3.1. Proponent

Warrego Energy is a private oil and gas development and production company established to invest in onshore unconventional gas assets. The company is Operator of the EP 469 Permit.

Warrego Energy's contact details are:

Level 11, London House
216 St. George's Terrace
Perth
WA 6000

Mobile: +44 (0) 7984 158 740

Website: <http://www.warregoenergy.com>

Email: info@warregoenergy.com

1.3.2. Contractors

Drilling and other services associated with this project will be provided to Warrego Energy by a number of specialist contractors. Warrego Energy will seek tenders for those services at appropriate points during 2017.

1.3.3. Environmental consultant

This EP has been prepared by Coffey Services Australia Pty Ltd (Coffey). Coffey's contact details are provided on the reverse of the inside title page of this document.

2.1. Key environmental approvals

A summary of the key environmental approvals that are relevant to the project is provided in Table 2.1.

Table 2.1 Key environmental approvals

Legislation	Requirement	Status	Agency
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Referral	Approved (EPBC 2013/7054).	DOTE
<i>Environmental Protection Act 1986</i>	Referral (Part IV)	EPA decided 'Not assessed'.	EPA
	Native Vegetation Clearing Permit (Part V)	Approved (CPS 5899/2).	DMP
<i>Wildlife Conservation Act 1950</i>	Permit To Take	Not required – no known DRF within conceptual disturbance footprint.	(DPAW)
<i>Petroleum and Geothermal Energy Resources Act 1967</i>	Environment Plan	This document has been submitted to the DMP for approval.	DMP
	Oil Spill Contingency Plan	An Oil Spill Response Plan will be submitted to DMP for approval prior to project activities commencing.	DMP
<i>Rights in Water and Irrigation Act 1914</i>	Section 5C licence	Application in preparation.	DoW

3. Project description

This chapter describes all activities proposed in connection with the project, including its location and schedule.

3.1. Location and tenure

The project is located onshore approximately 50 km southeast of Dongara and 230 km north of Perth, Western Australia (see Figure 1.1). EP 469 was issued to Warrego Energy on 16 April 2010 and is due to expire on 15 April 2019. Warrego Energy is Operator of the project.

West Erregulla-2 will be located in Vacant Crown Land (VCL) in the Shire of Three Springs relatively close to West Erregulla-1, which was drilled in 1990.

3.2. Duration and timing

The project is currently scheduled to be undertaken in a phased approach between November 2017 and July 2018. The project's timing is driven by (a) obligations under the exploration permit, (b) the interpretation of data from the 3D seismic survey, (c) the availability of drilling equipment and contractors, and (d) finalisation of funding arrangements.

Warrego Energy is planning to drill WE-2 around the end of Q1 of 2018. Warrego Energy is in discussions with several drilling rig providers and will tender a drilling contract when funding for the project has been secured.

An indicative project schedule is provided in Table 3.1. The well is currently planned to be suspended following the initial drilling, pending interpretation of drill cores and any logs run. The timeframes shown in Table 3.1 for well suspension, demobilisation, rehabilitation and post-rehabilitation monitoring will therefore be dependent upon any decisions or modifications to the project made after the interpretation of well data. Warrego Energy may seek DMP's approval for an amended EP including modified or additional activities (e.g., further drilling, well testing) during the well suspension phase, with the amended EP to include updated timing and details regarding demobilisation, rehabilitation and post-rehabilitation monitoring.

Table 3.1 Indicative project schedule

Activity	Estimated duration	Estimated timing
Geotechnical/ground-truthing investigations and site preparation	4–6 weeks	November/December 2017
Mobilisation of equipment	2 weeks	January 2018
Drilling	5 weeks	February/March 2018
Well suspension*	1 week	April/May 2018
Demobilisation of equipment*	2 weeks	May/June 2018
Rehabilitation*	2 weeks	June/July 2018
Post-rehabilitation monitoring*	Minimum of two years and until rehabilitation criteria have been met	Annually between August and September

* Activities are indicative only and subject to change depending on results from the drilling.

The project will operate seven days a week. Site preparation, rehabilitation and post-rehabilitation monitoring will be conducted during daylight hours only. All other activities will be carried out on a 24-hour basis.

3.3. Project activities

The project will comprise the following activities, which are discussed in more detail throughout this chapter:

- geotechnical/ground-truthing investigations;
- site preparation;
- mobilisation of equipment;
- drilling;
- well suspension;
- demobilisation of equipment and rehabilitation; and
- post-rehabilitation monitoring.

All project activities will be confined to the project area (Figure 3.1). The development footprint will include the access road, the well site and associated fire breaks, accommodation camp and a hygiene station.

3.3.1. Geotechnical/ground-truthing investigations

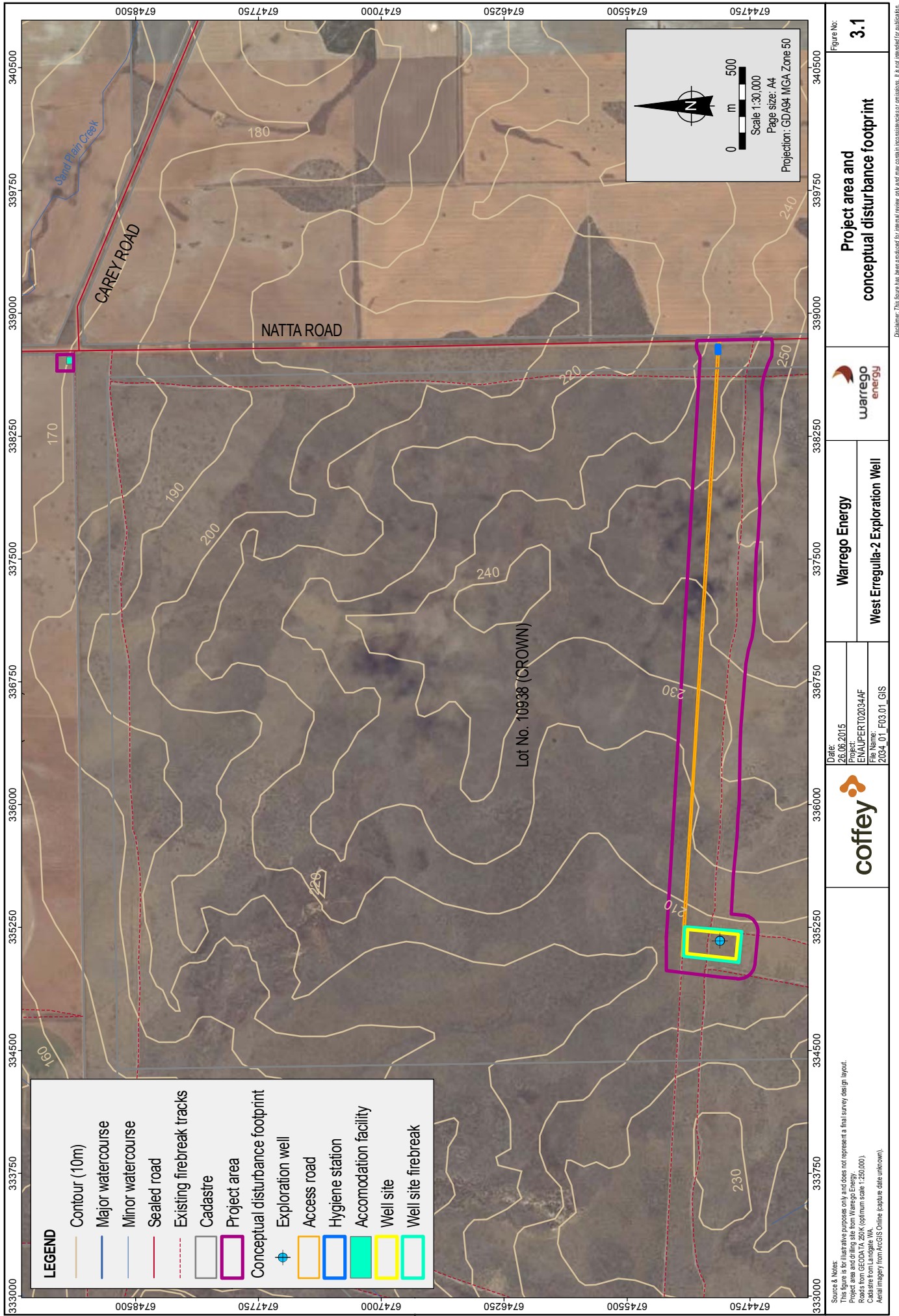
Minor ground-truthing and geotechnical investigations will be required within the project area. These activities will determine construction requirements, and accurately locate and demarcate all areas of disturbance, and areas that need to be avoided ahead of site preparation. These advance investigations may require minor ground disturbance, including, for example, digging shallow pits to determine soil composition.

Environmental consideration relevant to the timing of this activity are set out in Table 3.2.

Table 3.2 Timing and environmental considerations for geotechnical/ground-truthing investigations

	Timing	Environmental considerations
Timeframe	November/December 2017	Fire risk through operating vehicles in areas of remnant vegetation.
Duration	2 weeks	Activity not continuous; i.e. ad-hoc basis only.
Hours of operation	Daylight hours only	Best visibility while driving in areas of remnant vegetation. Nocturnal fauna not active. Reptiles may be active.

3.1 Project area and conceptual disturbance footprint



3.3.2. Site preparation

Site preparation activities that may be required include:

- upgrading of an existing firebreak to serve as the project's access road permitting passage of heavy goods vehicles and relatively long and/or wide loads during mobilisation and demobilisation;
- construction of a well site with a surrounding firebreak;
- installation of a groundwater bore on the well site;
- construction of a temporary accommodation camp; and
- construction of a hygiene station.

Areas of disturbance will be planned around known locations of Threatened flora and Priority 1 flora and, where possible, known locations of Priority 2 flora. Warrego Energy will minimise the area of native vegetation to be cleared by using existing access roads, firebreaks and seismic lines where possible. All areas of disturbance will be clearly marked out by surveyors prior to clearing being undertaken.

Soil, fill or sheeting material required for site preparations may be sourced from within the project area or outside the project area (e.g. via contractors). Preliminary investigations have estimated that the existing firebreak tracks within the project area contain enough gravel for use on the well site and in upgrading the track to serve as the project access road. Any soil, fill or sheeting material needing to be brought into the project area will be sourced and handled in accordance with the hygiene requirements of the Dieback and Weed Management Plan (DWMP).

Water may be sourced from existing groundwater bores by arrangement with a nearby landholder. In this case, water will be transferred from the bores to the well site by truck. Alternatively, a groundwater bore may be established within or adjacent to the well site.

A temporary accommodation camp will be constructed on private land by arrangement with the landowner. The land is presently used for agricultural purposes and is already cleared. Site preparation works for the accommodation camp may require minor hard-standing works for vehicle parking and portable building placement.

The hygiene station will be constructed at the intersection of the access road with Natta Road. The hygiene station footprint will be prepared to a similar standard as the access road, requiring clearing and sheeting/screening material to be laid down. Surface water diversion structures will be required for surface water run-off from the hygiene station.

Personnel involved in site preparation works will be required to undergo inductions prior to commencing work. All equipment, vehicles and personnel involved in site preparation will be subject to hygiene controls as specified in the DWMP.

An inventory of expected clearing requirements is shown in Table 3.3.

Table 3.3 Expected clearing requirements

Component	Nominal dimensions	Clearing requirement
Access road	10 m wide x 4 km long	0.03 ha
Well site	130 m x 260 m	3.28 ha
Firebreak around well site	20 m wide	1.88 ha
Hygiene station	50 m x 20 m	–
Accommodation camp	50 m x 50 m	–

Component	Nominal dimensions	Clearing requirement
Total	–	5.19 ha

Note: The accommodation camp will be located on agricultural land that is already cleared. The access track and hygiene station will follow an existing firebreak and are not expected to require any additional clearing with the exception of approximately 0.03 ha to allow for widening of the access road entry at Natta Road.

Environmental consideration relevant to the timing of this activity are set out in Table 3.4.

Table 3.4 Timing and environmental considerations for site preparation

	Timing	Environmental considerations
Timeframe	November/December 2017	Fire risk through operating vehicles and machinery (e.g. bulldozers) in areas of remnant vegetation.
Duration	4 weeks	Dust generated during and following ground disturbance activities.
Hours of operation	Daylight hours only	Best visibility while driving in areas of remnant vegetation. Nocturnal fauna not active. Reptiles may be active.

3.3.3. Mobilisation of equipment

A range of vehicles and equipment will be required on-site for the project. These may include:

- light utility vehicles;
- water carters;
- fuel tankers;
- waste carters;
- fire response vehicles;
- bulldozers;
- semi-trailers and low-loaders;
- lighting towers; and
- generators.

Vehicles will access the site using public roads, turning off Natta Road and driving along the project access road to West Erregulla-2 (see Figure 3.1). To minimise the environmental footprint of the project, Warrego Energy will use an existing firebreak to access the site and the access road will comprise a single lane only. A traffic management system will be adopted such that single lane traffic movements are controlled from the well site. A security/hygiene post will be established at the junction with Natta Road. The existing firebreak is wide enough to accommodate the width of vehicles servicing West Erregulla-2 and no additional clearing is expected, with the exception of approximately 0.03 ha to allow for widening of the entry at Natta Road. Up to 6 m of the firebreak will be sheeted using gravel from existing areas of disturbance within the project area to form the project's access road.

All equipment, vehicles and personnel entering the project area will be subject to hygiene controls as specified in the DWMP or land access agreement as appropriate. This includes any vehicles transported to the project area on a semi-trailer or low-loader.

With the exception of an accommodation facility, which is intended to be located outside the VCL, and a security/hygiene control point at the junction with Natta Road, all project infrastructure will be

accommodated at the well site. A variety of equipment and infrastructure will be set up at the well site and may include:

- drilling rig;
- sundry service cabins and equipment; e.g., mudlogging cabin and wireline service equipment;
- laydown and equipment storage areas;
- sumps and pits;
- portable offices;
- chemical storage areas (including dangerous goods and/or hazardous materials); and
- vehicle parking.

Infrastructure requirements are set out in more detail in Section 3.4.

Environmental considerations relevant to the timing of this activity are set out in Table 3.5.

Table 3.5 Timing and environmental considerations for mobilisation

	Timing	Environmental considerations
Timeframe	January 2018	Fire risk through operating vehicles and machinery in areas of remnant vegetation.
Duration	2 weeks	Short-term impact to other users of local roads.
Hours of operation	Daylight hours only	Best visibility while driving in areas of remnant vegetation. Nocturnal fauna not active. Reptiles may be active.

3.3.4. Drilling

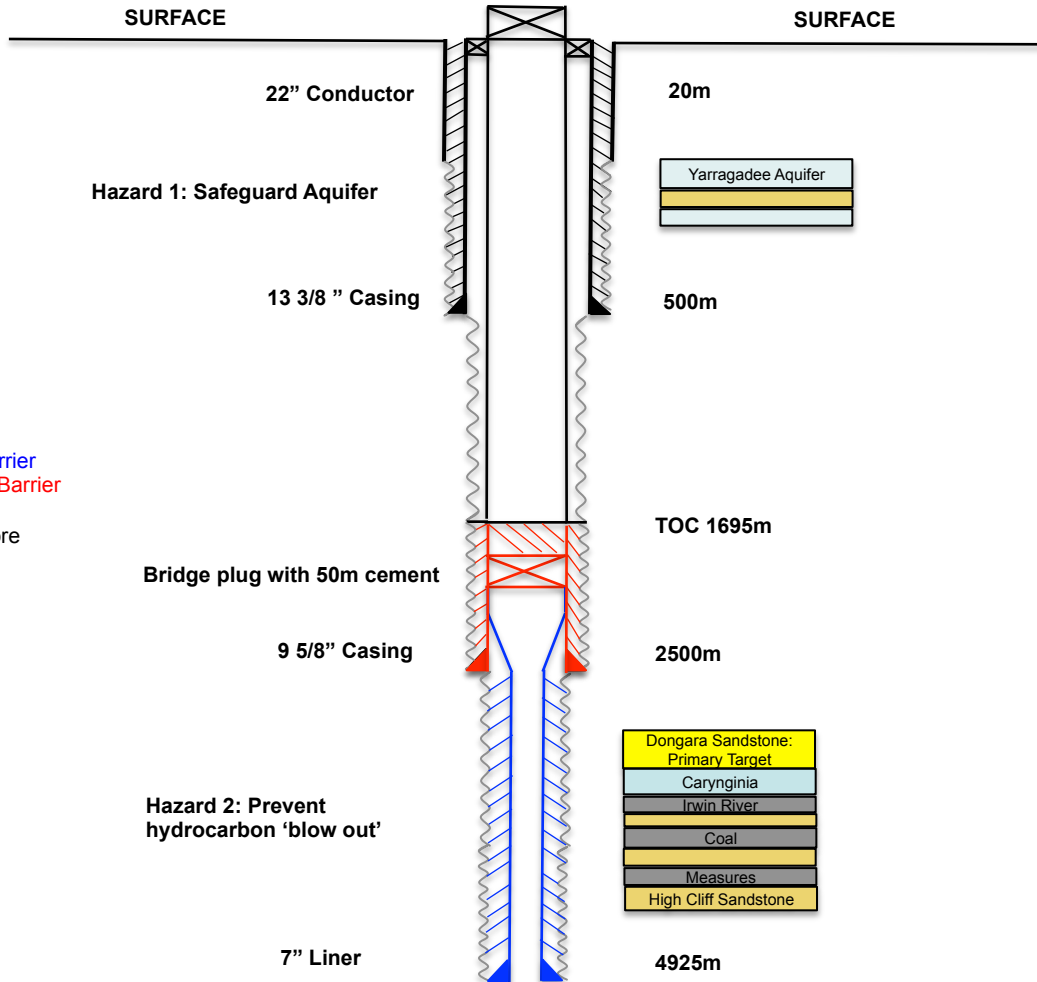
Warrego Energy is in discussions with several drilling rig providers and will tender a drilling contract when funding for the project has been secured and finalised. The well will be drilled using standard onshore drilling techniques that are consistent with industry best practice.

The targets for West Erregulla-2 are the Permian age Dongara/Wagina sandstones and the deeper Permian sandstones of the Kingia, High Cliff and Irwin River formations. These were confirmed by 3D seismic survey in 2014 to be at depth below the surface of approximately 4,000 and 4,925 m respectively.

The conceptual well design is illustrated in Figure 3.2, with details provided in Table 3.6.

Figure 3.2 Conceptual Well Design

WEST ERREGULLA 2 – WELL BARRIER SCHEMATIC
SUSPENDED WELL



Blue = Primary Well Barrier
 Red = Secondary Well Barrier
 ///// = Cement
 ~~~~~ = 'Drilled hole' before casing is run into it

**Table 3.6 Details of the conceptual well design**

| Parameter                            | Details                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Approximate location of surface hole | Latitude: 29° 24' 50.8" S<br>Longitude: 115° 18' 03.6" E                                                                                                                                                                                                                                                                                                                                                                  |
| Vertical depth                       | 4,925 m                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Well type                            | Vertical well to maximum anticipated depth 4,925 m.                                                                                                                                                                                                                                                                                                                                                                       |
| Drilling rig                         | (to be advised)                                                                                                                                                                                                                                                                                                                                                                                                           |
| Casing design                        | <ul style="list-style-type: none"> <li>• Surface conductor (22") to 20 m.</li> <li>• Intermediate casing string (13 3/8") to ±500 m as standard practice to isolate the Yarragadee Aquifer.</li> <li>• Casing string (9 5/8") to 2,500 m to isolate the Cadda Formation / Cattamarra Coal Measures and isolate potential unstable zones.</li> <li>• Liner string (7") in 8½" hole to target depth of ±4,925 m.</li> </ul> |
| Drilling duration                    | 35 days (estimated)                                                                                                                                                                                                                                                                                                                                                                                                       |
| Volume of cuttings                   | 319 m <sup>3</sup> (estimated)                                                                                                                                                                                                                                                                                                                                                                                            |
| Well site dimensions                 | 130 m x 260 m, with 20 m cleared firebreak surrounding the well site                                                                                                                                                                                                                                                                                                                                                      |
| Operational hours                    | 24 hours per day, 7 days per week                                                                                                                                                                                                                                                                                                                                                                                         |
| Number of personnel                  | Approximately 50-60 depending on operations                                                                                                                                                                                                                                                                                                                                                                               |

Note: details are based on the conceptual well design and may be subject to change.

Drilling West Erregulla-2 will proceed as follows:

- drill the well with a rotary drilling rig using recirculated water-based mud;
- progressively case the well as it is drilled;
- progressively cement well casings as the well is drilled;
- subsequent to each casing and cement job, and prior to commencing drilling the next hole section, the integrity of the casing and cementing will be verified by (a) pressure testing, (b) CBL/USIT wireline logging and (c) formation integrity tests conducted after drilling out the casing shoe;
- continue drilling through both the Dongara and Wagina Sandstone formations passing through and correlating actual formation tops with seismic interpretation detail;
- deepen the well into the Kingia, High Cliff and Irwin River formations and log the section;
- proceed to complete the Kingia et al. formations; and
- clean-up.

Warrego Energy expects it will take 35 days to drill the well (see Table 3.1). No hydraulic stimulation or testing of the well is proposed.

Potential risks to the environment will be considered when selecting drilling fluids for use in the exploration program. Water-based muds will be used to drill the entire well. Bentonite (spud mud) will be used to drill the upper section (0 to 500 m). Potassium chloride-polymer (KCl polymer) will be used to drill the remainder of the well. Sized calcium carbonate will be added to the drilling fluids as required to prevent lost circulation during drilling. A full list of chemicals proposed for use in drilling will be disclosed to, and approved by, the DMP ahead of drilling activities commencing.

Other chemicals may be used during drilling operations including:

- sodium montmorillonite;

- caustic soda;
- soda ash;
- biocide-gluteraldehyde;
- partially hydrolysed poly-acrylamide;
- sodium sulphite;
- polyanionic cellulose;
- barium sulphate;
- cement and cementing chemicals;
- radiator inhibitors;
- citric acid; and
- glycol.

All chemicals used will be stored within a designated, bunded chemical storage area located on the well site (see Section 3.4.7). A list of all chemicals that may be used downhole is provided in Appendix E.

The drilling muds and cuttings will be disposed of into an earthen sump, which will be lined with a multi-laminate polyethylene liner. This liner material is waterproof and has good chemical and abrasion resistance and will prevent contamination of the surrounding soils from any hydrocarbons lifted with the muds. Once the water has evaporated and no liquid is remaining, sediment in the sump will be tested for the presence of contaminants (including hydrocarbons). Any contaminated material present will be removed and disposed of off-site. The liner will be removed and disposed of, and the sump (minus any contaminated material) will be backfilled during remediation of the well site.

To reduce instances of fauna coming in contact with drilling chemicals and hydrocarbons, a fence will be maintained between the well site and surrounding vegetation until the sump contents have evaporated. Fauna egress points will be provided in accordance with DMP guidelines.

Environmental consideration relevant to the timing of this activity are set out in Table 3.7.

**Table 3.7 Timing and environmental considerations for drilling**

|                           | Timing                               | Environmental considerations                                                                                                                     |
|---------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Timeframe</b>          | February/March 2018                  | Fire risk through operating vehicles, and plant in areas of remnant vegetation. Use of water is at a time of potential lower water availability. |
| <b>Duration</b>           | 5 weeks                              | Noise and light impacts to nearby fauna.                                                                                                         |
| <b>Hours of operation</b> | 24 hours per day,<br>7 days per week | Best visibility while driving in areas of remnant vegetation. Nocturnal fauna active. Light impacts to nearby fauna.                             |

### 3.3.5. Well suspension

Following the completion of drilling, West Erregulla-2 will be suspended until the results of the drilling operations have been analysed and any further well operations, suitable short and long-term production opportunities, or further exploration opportunities, are identified. The well will be suspended in accordance with relevant regulations and practice, with a subsurface cement plug to be installed. Equipment on the well site will be largely demobilised. Infrastructure associated with the well head will be secured and left in situ, while supporting facilities such as offices, stored drilling muds, casing etc. will be removed from site. Above-surface infrastructure to remain will include the

Christmas tree installed on the well head. Sumps will be allowed to evaporate. Fencing will remain in situ with all access gates secured. The well site will be monitored during the well suspension phase via the use of closed-circuit video monitoring and regular on-ground inspections.

If Warrego Energy determines at a future stage to proceed with production and/or requires any further drilling or intervention activities, these activities would be subject to further approvals by the relevant agencies. Further approvals would be required to cover the installation and operation of surface production equipment, which does not form part of this project. Similarly, any further exploration activities identified would need to be proposed and approved by the relevant agencies.

Environmental consideration relevant to the timing of this activity are set out in Table 3.8.

**Table 3.8 Timing and environmental considerations for well suspension**

|                           | Timing                               | Environmental considerations                                                                                                                    |
|---------------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Timeframe</b>          | April/May 2018                       | Fire risk through operating vehicles and plant in areas of remnant vegetation. Use of water is at a time of potential lower water availability. |
| <b>Duration</b>           | 1 week                               | Noise and light impacts to nearby fauna.                                                                                                        |
| <b>Hours of operation</b> | 24 hours per day,<br>7 days per week | Best visibility while driving in areas of remnant vegetation. Nocturnal fauna active. Light impacts to nearby fauna.                            |

### 3.3.6. Demobilisation and rehabilitation

Following a decision to decommission and abandon West Erregulla-2, the well will be abandoned in accordance with the regulatory regime prevailing at the time. Activities are likely to include setting multiple cement plugs in the open hole and again at the surface, then covering the site with soil in accordance with the PGER Act. The collar will be removed from the wellhead cellar and the cellar backfilled to a grade consistent with the adjacent area. All facilities will be decommissioned and dismantled and an abandonment plaque posted in accordance with the Well Management Plan required under the Petroleum and Geothermal Energy Resources (Resource Management and Administration) Regulations 2015.

Before rehabilitation is initiated, any infrastructure associated with the WEEP not removed during well suspension will be removed (unless otherwise requested by local authorities and/or relevant stakeholders), any contaminated material will be removed and disposed of offsite in accordance with the requirements of local authorities. All excavations will be backfilled.

Areas disturbed by the project will be rehabilitated and restored to the best of Warrego Energy's ability to their original condition.

Rehabilitation will be undertaken in accordance with a Rehabilitation Management Plan (RMP). The existing RMP developed for the 3D seismic survey completed in 2014 will be revised in consideration of this project, then resubmitted to the DMP for approval prior to the completion of operational activities (i.e., drilling).

Where further well operations or wells are approved by the relevant authorities and implemented, the rehabilitation management plan will be revisited in consideration of these ongoing activities (i.e. some of the rehabilitation activities may be postponed until all activities are complete).

Environmental consideration relevant to the timing of these activities are set out in Table 3.9 and 3.10.

**Table 3.9 Timing and environmental considerations for demobilisation**

|                    | Timing              | Environmental considerations                                                                                      |
|--------------------|---------------------|-------------------------------------------------------------------------------------------------------------------|
| Timeframe          | May/June 2018       | Spread of dieback and weeds in wet conditions.                                                                    |
| Duration           | 2 weeks             | Short-term impact to other users of local roads.                                                                  |
| Hours of operation | Daylight hours only | Best visibility while driving in areas of remnant vegetation. Nocturnal fauna not active. Reptiles may be active. |

**Table 3.10 Timing and environmental considerations for rehabilitation**

|                    | Timing              | Environmental considerations                                                           |
|--------------------|---------------------|----------------------------------------------------------------------------------------|
| Timeframe          | June/July 2018      | During cooler time of year and prior to spring rainfall to assist with rehabilitation. |
| Duration           | 2 weeks             | None.                                                                                  |
| Hours of operation | Daylight hours only | None.                                                                                  |

### 3.3.7. Post-rehabilitation monitoring

Warrego Energy will implement a rehabilitation monitoring program after demobilisation is completed in accordance with the RMP. The monitoring program will be linked to the monitoring requirements of the DWMP.

Rehabilitation monitoring will continue for a minimum of two years and then until the rehabilitation completion criteria have been met.

Environmental consideration relevant to the timing of this activity are set out in Table 3.11.

**Table 3.11 Timing and environmental considerations for rehabilitation monitoring**

|                    | Timing                                                               | Environmental considerations |
|--------------------|----------------------------------------------------------------------|------------------------------|
| Timeframe          | Annually between August and September                                | During spring.               |
| Duration           | Minimum of two years and until rehabilitation criteria have been met | None.                        |
| Hours of operation | Daylight hours only                                                  | None.                        |

## 3.4. Project infrastructure and services

The project will require the following infrastructure and services:

- access road;
- well site;
- turkey's nest dam and pits/sumps;
- hygiene station;

- accommodation facilities;
- water supply;
- power supply; and
- chemical and hazardous substances storage.

### **3.4.1. Access roads**

As the project will be situated in VCL in an area of remnant native vegetation, an access road will be required to connect the well site to Natta Road. As previously stated in Section 3.3.2, an existing firebreak will be used to reduce the amount of vegetation clearing and overall impact of the project. The firebreak will be upgraded to be suitable for the expected traffic type and volume.

### **3.4.2. Well site**

Drilling will be conducted on a well pad constructed within the well site from fill material, which will either be sourced from existing disturbance within block EP 469 or transported into the site as described in Section 3.3.2. The well site will be approximately 130 m wide by 260 m long and will contain all equipment and infrastructure required for the drilling operation. Once the well site has been established, all activities associated with drilling will occur within the well site (e.g., refuelling, batching of drilling muds and cement, etc.). Space will also be required for site offices, vehicle parking and equipment storage. The well site will be surrounded by a 20 m wide cleared firebreak.

The well site will also accommodate three excavated sumps/pits, which will be used to store muds, drill cuttings and fresh water. To prevent contamination to underlying soils, the pits will be lined with a membrane that will be removed in the course of demobilisation and rehabilitation activities (Section 3.3.7).

Figure 3.3 shows the conceptual well site layout.

### **3.4.3. Hygiene station**

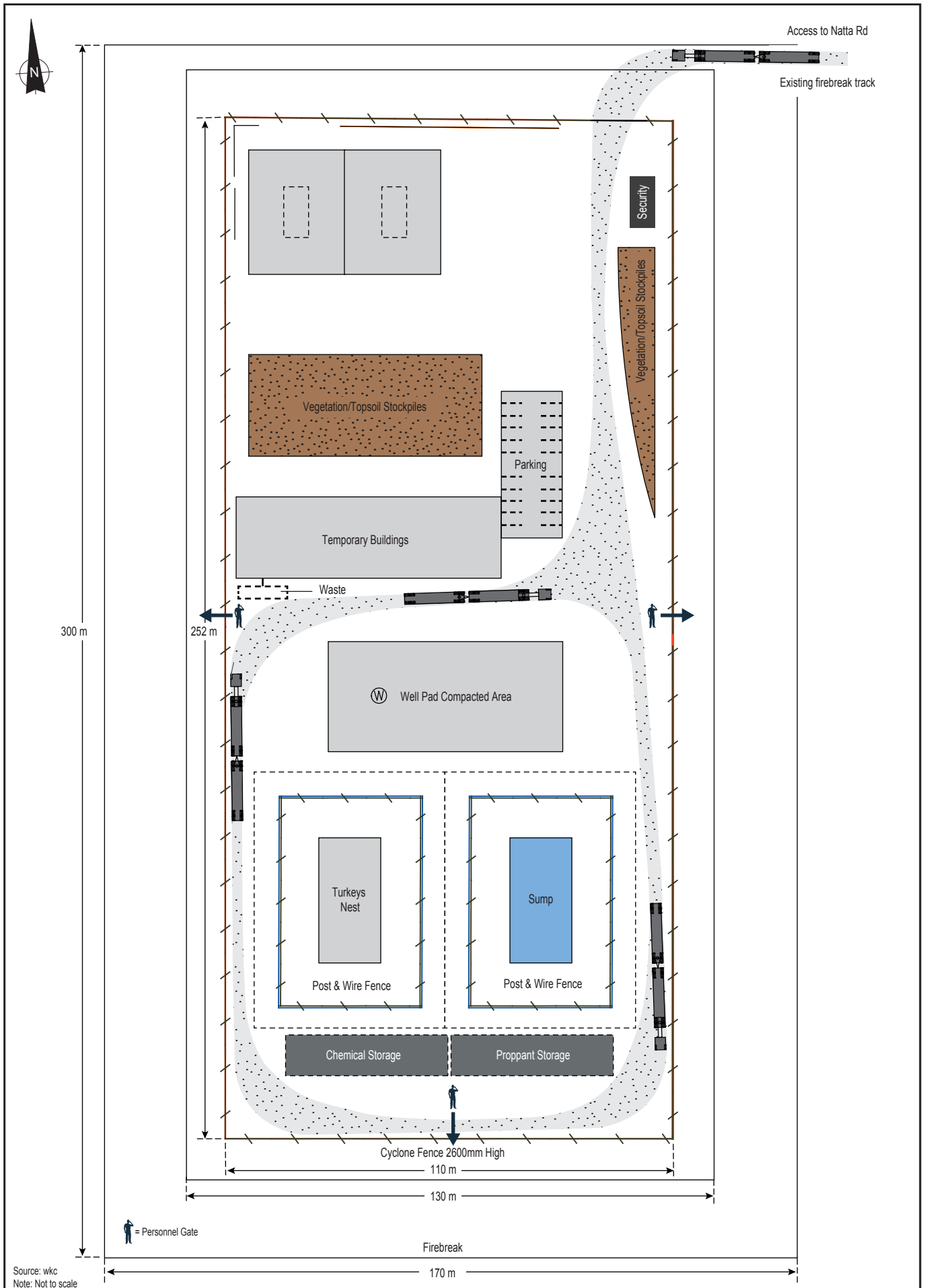
As part of the project's biosecurity requirements and as documented in the DWMP, a vehicle and equipment hygiene station will be operated as part of project activities. The preference is for the operation of a dry hygiene facility involving the use of compressed air and brushes to remove soil and plant material.

The hygiene station will require an area of approximately 5 m by 20 m (0.01 ha) and will be located within the existing firebreak at the intersection of the project access road with Natta Road (see Figure 3.1).

All vehicles, equipment, plant and machinery must be documented as clean before initially arriving in the project area and will be required to pass through the hygiene station when travelling to the well site.

Full details of hygiene requirements are available in the DWMP.

3.3 Conceptual well site layout



Source: wkc  
Note: Not to scale

|  |                                   |                                                     |  |                             |                          |
|--|-----------------------------------|-----------------------------------------------------|--|-----------------------------|--------------------------|
|  | Date:<br>19.06.2015               | Warrego Energy<br>West Erregulla-2 Exploration Well |  | Conceptual well site layout | Figure No:<br><b>3.3</b> |
|  | File Name:<br>2034_01_F03.03_GL_2 |                                                     |  |                             |                          |

### 3.4.4. Accommodation facilities

Accommodation facilities will be required to house personnel for the duration of the project. The majority of the crew will be accommodated at a camp to be constructed on private land adjacent to the corner of Carey Road and Natta Road, about 7 km northeast of the well site. The camp location is within the Shire of Three Springs.

The camp will be of a temporary, portable nature and will include:

- accommodation for 55 - 65 persons;
- ablutions and laundry;
- an office;
- a dining hall and kitchen;
- a medical room;
- recreation and gymnasium facilities;
- storage for frozen, refrigerated and unrefrigerated goods;
- storage for potable and non-potable water;
- storage for sewage and greywater; and
- a self-bunded diesel generator;

A conceptual layout for the accommodation camp is shown on Figure 3.4.

Accommodation infrastructure and services will be provided by a contractor. The contractor will be responsible for the mobilisation, construction, operation and demobilisation of the camp in its entirety, subject to (a) Warrego Energy's health, safety and environment requirements and (b) any applicable landowner conditions. Details of services required for the camp (e.g. water supply, sewage disposal etc.) are covered in the following sections.

Any overspill personnel will be accommodated at Mingenew.

### 3.4.5. Water supply

Water will be required for operational (non-potable water) and domestic use (potable water). Non-potable will be required for construction, dust suppression and drilling activities. Potable water will be required for drinking and other domestic uses.

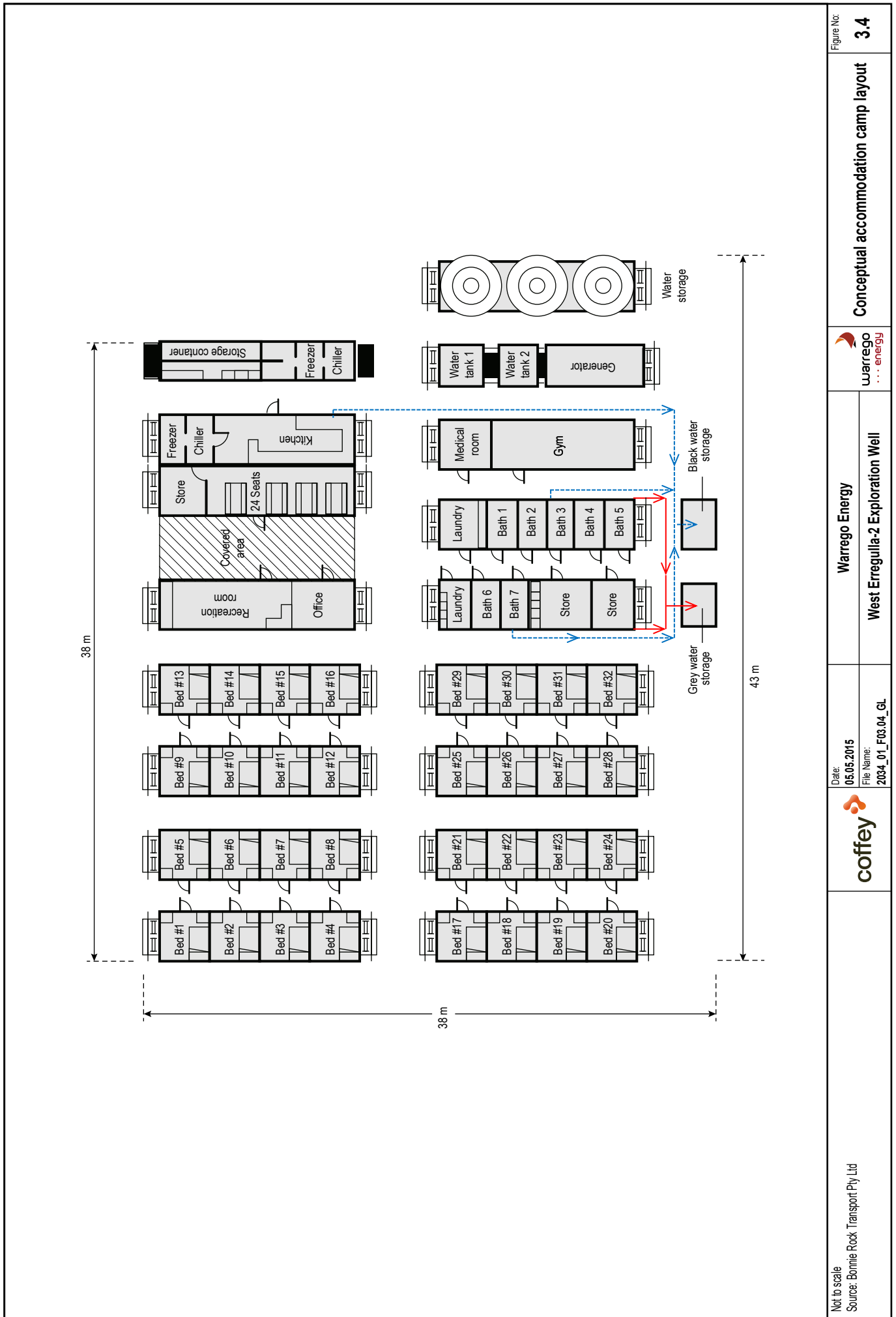
Nominal water demand is provided in Table 3.12.

**Table 3.12 Nominal water demand**

| Source                     | Estimated requirement (L) |
|----------------------------|---------------------------|
| Site preparation (general) | 450,000                   |
| Dust suppression           | 100,000                   |
| Drilling                   | 1,500,000                 |
| <b>Total</b>               | <b>2,050,000</b>          |

Water is proposed to be sourced from existing groundwater bores by arrangement with nearby landholders. Water will be transferred from the abstraction bores to the well site by water bowser.

3.4 Conceptual accommodation camp layout



|                                                       |  |                                                  |                                                     |  |                                                        |
|-------------------------------------------------------|--|--------------------------------------------------|-----------------------------------------------------|--|--------------------------------------------------------|
| Not to scale<br>Source: Bonnie Rock Transport Pty Ltd |  | Date: 05.05.2015<br>File Name: 2034_01_F03.04_GL | Warrego Energy<br>West Erregulla-2 Exploration Well |  | Figure No: 3.4<br>Conceptual accommodation camp layout |
|                                                       |  |                                                  |                                                     |  |                                                        |

### **3.4.6. Power supply**

A self-bunded portable diesel generator will supply power for the project. Other equipment (e.g., lighting towers) may contain their own self-bunded generators.

All electrical equipment, instrumentation, lighting and cabling will be installed in accordance with relevant regulations and standards.

### **3.4.7. Chemical and hazardous substances storage**

Oil, fuel, chemicals and other hazardous substances will be stored in a bunded chemical storage area or in self-bunded tanks on the well site. The bunding around the chemical storage area will be built to the appropriate standard for the chemical class and in accordance with relevant material safety data sheets (MSDSs). A MSDS for each chemical handled and stored on site will be held in the site office and displayed in the chemical storage area. A Hazardous Materials Register will be maintained on site.

Hazardous materials that may be on-site during the project include:

- diesel fuel for vehicles, equipment and power generation;
- hydrocarbon-based oils and greases, hydraulic fluids, batteries and tyres for vehicle and equipment maintenance; and
- natural gas for heating and cooking.

A list of all chemicals that may be used downhole is provided in Appendix E.

### **3.4.8. Waste management**

A variety of waste is likely to be generated during the project, including:

- domestic waste;
- inert waste;
- recyclables;
- hazardous waste; and
- septic waste.

Waste from the well site and the accommodation camp may be managed separately.

An outline of waste management is provided in Table 3.13.

**Table 3.13 Waste management**

| Waste type                                                                                                                                                                                                       | Sources                                                                                                                                                                                                                                                                            | Handling and storage method                                                                                                                                                                                      | Disposal method                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Domestic wastes: food scraps, light paper, cardboard, putrescible and plastic waste.                                                                                                                             | <ul style="list-style-type: none"> <li>General workforce activity.</li> </ul>                                                                                                                                                                                                      | Stored within sealed bins on-site.                                                                                                                                                                               | <p>Non-recyclables in accordance with local requirements (Shire of Three Springs).</p> <p>Recyclables to be sent to an approved recycling facility.</p> |
| Industrial wastes: wood, scrap metals (non-toxic), scrap tyres, rubber and synthetic materials, and other inert, mixed industrial wastes.                                                                        | <ul style="list-style-type: none"> <li>Site preparation (scrap from construction and establishment of project infrastructure).</li> <li>Vehicle and equipment maintenance.</li> <li>Demobilisation (scrap from decommissioning and dismantling project infrastructure).</li> </ul> | Stored within skip bins or in a designated storage area on the well site if too large for skip bins.                                                                                                             | <p>Non-recyclables in accordance with local requirements (Shire of Three Springs).</p> <p>Recyclables to be sent to an approved recycling facility.</p> |
| <p>Hazardous material wastes: diesel fuel, hydraulic fluids, lubricants (oils and greases), batteries, battery acid and other chemicals.</p> <p>Reservoir fluid, drilling fluid, contaminated drill cuttings</p> | <ul style="list-style-type: none"> <li>Vehicle and equipment maintenance.</li> <li>Cleaned up spills.</li> <li>Sumps and pits</li> </ul>                                                                                                                                           | Hazardous materials to be stored separately and in accordance with <i>Dangerous Goods Safety Act 2004</i> and regulations where applicable. On-site handling of dangerous goods will be managed by a contractor. | Hazardous materials to be disposed of off-site in accordance with local requirements (Shire of Three Springs).                                          |
| Septic wastes: sewage and grey water.                                                                                                                                                                            | <ul style="list-style-type: none"> <li>Ablutions.</li> <li>Domestic activities.</li> </ul>                                                                                                                                                                                         | Stored on-site in septic tanks.                                                                                                                                                                                  | Septic waste will be disposed of off-site by a controlled waste contractor.                                                                             |

## **4. Existing environment**

This chapter reviews the physical, biological and cultural environment of the area within which the project is situated.

### **4.1. Physical environment**

This section describes climate, landform, soils, surface water, groundwater, air quality and noise.

#### **4.1.1. Climate**

Exploration permit EP 469 is located within the Lesueur Sandplain subregion of the Geraldton Sandplains bioregion, as defined by the Interim Biogeographic Regionalisation for Australia (IBRA). The climate of the region is described as Mediterranean, with dry, warm summers and wet, cool winters (BOM, 2012).

Climate data from Eneabba weather station, approximately 43 km south of EP 469, shows the warmest period in the region is from December to March, with average maximum temperatures from 1972 to 2017 ranging from 33.6 to 36.5°C. The lowest temperatures generally occur between June and September, with average minimum temperatures ranging from 8.9 to 10.1°C during these months (BOM, 2017).

Average rainfall in the region from 1964 to 2017 is highest during the cooler months between May and August. Rainfall during these months ranges from 69.3 to 99.0 mm per month. The driest months are between November and March, with rainfall ranging from 7.5 to 14.8 mm in this period. The average annual rainfall at Eneabba is 489.4 mm (BOM, 2017).

#### **4.1.2. Geology, soils and landforms**

EP 469 is located within the Geraldton Sandplains bioregion (Lesueur Sandplain sub-region) under IBRA (Woodman Environmental, 2013). The Lesueur Sandplain subregion (GS3) comprises coastal Aeolian and limestones, Jurassic siltstones and sandstones of central Perth Basin (Desmond & Chant, 2001).

Soils in this region are described as yellow sands inland and leached sandy soils near the coast, which overlay laterite. This region is almost completely underlain by sedimentary rocks of siliceous nature. The sedimentary rocks form a series of plateaux, including the Dandaragan Plateau, on which the Permit is located (Beard 1990; Woodman Environmental, 2013). These plateaux have been eroded by the sea on the west and dissected by rivers, but substantial stretches of the plateau surfaces are still preserved and form extensive monotonous sandplains.

#### **4.1.3. Surface water**

The project area is devoid of any significant permanent surface water features. Numerous small watercourses dissect the surrounding area, draining either westwards from the Arrowsmith Region onto the Swan Coastal Plain, or north or south towards the two nearest river systems (RPS, 2011). The most significant surface water features in the vicinity of the project are two regional drainage systems – the Arrowsmith River, about 15 km to the south of the project area, and the Irwin and Lockier Rivers to the north of the project area (see Figure 4.1) (RPS, 2011).

There are also several small ephemeral creeks within EP 469 but these are not a feature of the project area (Figure 4.1). The nearest watercourse is Sand Plain Creek, about 6 km north of the well site.

#### **4.1.4. Groundwater**

The project area overlies the Yarragadee Formation aquifer, which is the largest aquifer in the Perth Basin. The Yarragadee Formation is comprised mainly of sand with minor shale and siltstone interbedded within it and lies over the Cadda Formation. It covers an area from north of Dongara to the Serpentine area south of Perth (RPS, 2011).

The geological units that will be encountered by the well include (in order of increasing depth) the Yarragadee Formation, Cadda Formation, Cattamarra Coal Measures, Eneabba Formation, Lesueur Formation, Woodada Formation, Kockatea Shale, Dongara/Wagina Sandstone, Kingia Sandstone, High Cliff Sandstone and potentially Irwin River Coal Measures.

The water table is in the Yarragadee Formation around 145 m below ground level (about 70 mAHD). Groundwater in the Yarragadee Formation has a multilayered flow system and generally moves downwards and to the southwest.

The Cadda Formation underlies the Yarragadee Formation at around 1,700 mAHD. This unit has low permeability and acts as a regional aquiclude, separating the Yarragadee Formation above from the Cattamarra Coal Measures below.

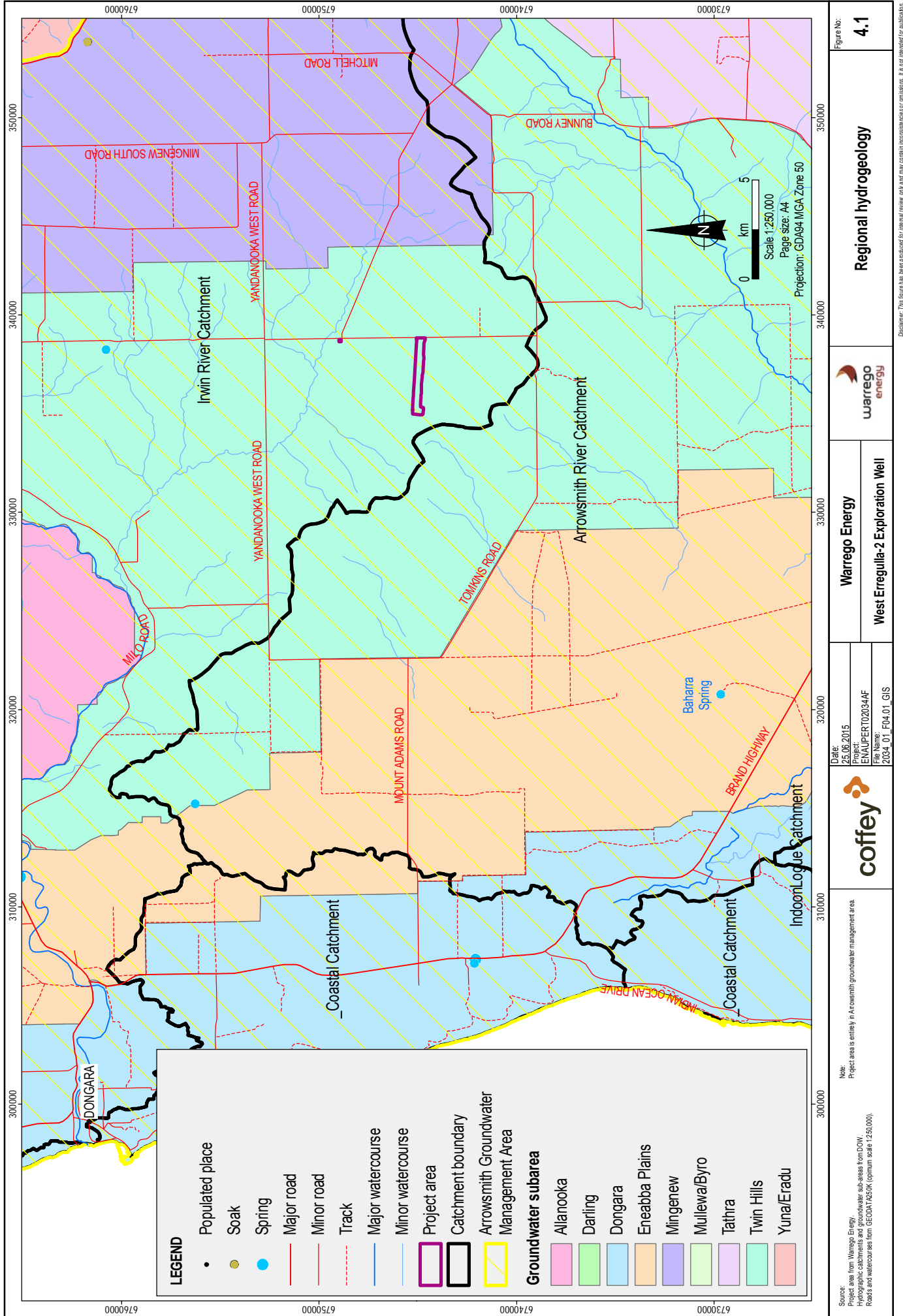
The Cattamarra Coal Measures and the Eneabba Formation both contain groundwater, but are understood to be internally confined by coal seams in the former and thick mudstone sequences in the latter. The Eneabba Formation is likely to be hypersaline and isolated from the upper Cattamarra Coal Measures.

Only the Yarragadee groundwater is likely to be considered economically exploitable due to the large costs involved in recovering groundwater from the Cattamarra Coal Measures (around 2,000 m below ground level) or any unit below (RPS, 2011). Water quality in the Yarragadee Formation aquifer is fresh to brackish, with salinity in the aquifer ranging between 500 to 1,000 mg/L.

The project is located within the Arrowsmith Groundwater Management Area, as proclaimed under the RIWI Act (RPS, 2011). Under the Act a licence is required from the DoW before water can be taken from a watercourse or ground water aquifer. For licensing and allocation purposes, the project area is located within the Twin Hills sub-area of the Arrowsmith groundwater area (RPS, 2011) (see Figure 4.1).

The main use of groundwater in the area from the Yarragadee Formation aquifer is irrigation and cattle grazing (RPS, 2011).

4.1 Regional hydrology



Warrego Energy  
 West Erregulla-2 Exploration Well

coffey

Warrego energy

Regional hydrogeology

Figure No: 4.1

Disclaimer: This figure has been produced for internal review only and may contain inaccuracies or omissions. It is not intended for publication.

### **4.1.5. Air quality and noise**

Air quality and noise emissions around the project area are expected to be slightly above natural ambient levels due to pastoral, industrial and tourism activities. The following regional sources may influence the ambient air quality and/or noise levels at the project area:

- gas/condensate production facilities (Beharra Springs);
- agricultural plant and machinery use; and
- talc mine (Three Springs).

These sources of emissions have a relatively low impact on the overall ambient air quality and noise levels in the area.

Activities associated with the project are similar to rural plant and machinery use activities. The drilling rig may produce higher levels of noise, however this noise is expected to be attenuated with the distance to the nearest sensitive receptor, which is a residence about 6 km to the southeast of the well site.

## **4.2. Biological environment**

This section describes the flora, vegetation, fauna and habitat of the project area and surrounds.

### **4.2.1. Bioregional context**

The Lesueur Sandplain subregion is known to contain a large number of distinct species rich and geographically restricted floristic communities (Mt Lesueur and Coomallo areas), as well as a number of rare flora, rare vertebrates and stygofauna of cave communities in Beekeepers Nature Reserve. This area is nationally and internationally regarded as having a particularly high floristic diversity and level of endemism (Desmond & Chant, 2001).

The subregion has approximately one-sixth of its area in conservation reserve. One wetland of national significance (Lake – Louge Inoon System) and two wetlands of subregional significance (White and Green Lakes, Saline Lakes of Coolimba – Jurien) are also located within the subregion (Desmond & Chant, 2001).

The eastern portion of the Lesueur Sandplain subregion has been cleared extensively, resulting in salinity problems (Desmond & Chant, 2001).

### **4.2.2. Flora and vegetation**

A Level 2 flora and vegetation survey has been conducted by Woodman Environmental Consulting (Woodman Environmental) in accordance with the EPA's Guidance Statement No. 51 Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA, 2004a). The survey included a desktop assessment, an initial reconnaissance visit in 2011, a detailed survey over three visits in spring 2011 and two further surveys in spring 2012.

The following section is based on the Woodman Environmental report (2013).

#### **Vegetation**

Vegetation within the Lesueur Sandplain subregion is comprised of proteaceous scrub-heaths rich in endemics. York Gum and Jam woodland occur on outwash plains and associated drainage. The vegetation of the subregion consists mainly of shrub-heaths rich in endemics on a mosaic of lateritic mesas, sandplains, coastal sands and limestones, with heath on lateritised sandplains along the north-eastern margins of the subregion (Desmond & Chant, 2001; Woodman Environmental, 2013).

The vegetation is broadly described as scrub on heath on sandplains near the coast with *Acacia-Casuarina* thickets further inland, *Acacia* shrub with scattered trees of *Eucalyptus loxophleba* on hard-setting loams (Beard, 1990). The Tathra vegetation system (Beard, 1976) in which the project is located is the most extensive vegetation system in the Dongara area and consists of scattered shrubs of 1 to 2 m height and a denser layer of shrubs to 1 m height. Species present include *Nuytsia floribunda*, *Eucalyptus tottiana*, *Banksia attenuata*, *Banksia menziesii* and *Banksia prionotes*. Also within the Tathra vegetation system, but on outcrops of laterite ridges and breakaways, is *Hakea auriculata*, which dominates a low heath cover to 60 cm height.

Woodman Environmental described and mapped 17 vegetation types (VTs) in the flora survey area. The condition of nearly all mapped vegetation within the flora survey area is classified '1' (or pristine). Remnant vegetation within private property (i.e., on agricultural land where the proposed accommodation camp is situated) varied in condition from pristine to poor depending on the number of weeds present and the decline in native species diversity relating to clearing and grazing impacts. Areas ranked good to poor were generally associated with Sand Plain Creek (Woodman Environmental, 2013).

No Threatened ecological communities (TECs) or priority ecological communities (PECs) were identified within the flora survey area and none of the VTs mapped in the flora survey area were equivalent to any TECs or PECs (Woodman Environmental, 2013).

## Flora

A total of 535 vascular flora taxa and one known hybrid, representing 64 families and 196 genera were recorded. Those included three Threatened flora species (*Eucalyptus crispata* and the orchids *Thelymitra stellata* and *Paracaleana dixonii*), 23 confirmed Priority species, one probable Priority species and one hybrid species.

The following conservation significant species are present within the project area (Figure 4.2):

- Threatened flora: *Paracaleana dixonii*;
- Priority 1 flora: *Micromyrtus rogeri*;
- Priority 2 flora: *Eucalyptus abdita*, *Schoenus badius* and *Persoonia filiformis*;
- Priority 3 flora: *Mesomelaena stygia* subsp. *deflexa*, *Guichenotia impudica*, *Stylidium drummondianum*, *Stylidium torticarpum* and *Synaphea oulopha*; and
- Priority 4 flora: *Banksia scabrella*.

Warrego is committed to avoiding all known locations of Threatened and Priority 1 flora. Note that *Synaphea oulopha* was previously listed as Priority 1 but has since been downgraded to Priority 3.

## Weeds

Woodman Environmental (2013) also recorded 22 species of introduced flora within the flora survey area. None of these weeds are listed as weeds of national significance. One species, *Echium plantagineum* (Paterson's Curse), is a declared pest under the BAM Act, but not for the shires within which the project occurs.

There are no known records of weeds within the project area.

## Dieback

Glevan Consulting (2012) was commissioned by Woodman to conduct an assessment for the presence of *Phytophthora* dieback within the flora survey area. No areas of remnant vegetation within the VCL were observed to be affected, infected or altered by any previous introduction of *Phytophthora* dieback. However, agricultural land (including areas of remnant native vegetation on such land) was not able to be mapped and is therefore considered unprotectable.

With the exception of the section of the project area over the proposed accommodation camp situated on agricultural land, the remainder of the project area should be considered as protectable from the *Phytophthora* dieback disease.

### 4.2.3. Terrestrial vertebrate fauna and associated habitat

In June 2012, Coffey conducted a Level 1 terrestrial vertebrate fauna survey that included the project area (Coffey Environments, 2013) in accordance with:

- EPA's Position Statement No. 3 Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA, 2002);
- EPA Guidance Statement No. 56 Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (EPA, 2004b); and
- EPA's Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA, 2010).

Coffey also undertook a Black Cockatoo habitat assessment in accordance with the EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species (DSEWPAC, 2012). Consistent with EPA Guidance Statement No. 56 (EPA, 2004b), this assessment was considered adequate given the scale and nature of impact associated with the project was assessed by Coffey to be low.

To fulfil a condition of Warrego Energy's EPBC Act approval, a survey for the Shield-backed Trapdoor Spider (*Idiosoma nigrum*) was also undertaken in February 2014 (Coffey, 2014).

The discussion in the remainder of this section is based on the reports mentioned above.

## Fauna habitat

The fauna assessment identified five fauna habitat types within the fauna survey area comprising cleared land, mixed shrubland with/without woodland species, laterite breakaway, open Eucalyptus forest, minor drainage lines and planted Eucalyptus habitats.

A large portion of habitat present within the survey area, namely the area of habitat within the VCL, was considered to be of Very Good quality with good connectivity to surrounding habitat of a similar condition to the west of the survey area. Areas of remnant vegetation within cleared land had a lower quality than similar habitats within the VCL, associated with their level of disturbance and reduced connectivity.

The fauna survey area is recognised as providing habitat critical to the survival of the Carnaby's Black Cockatoo (DEC, 2012), including:

- Foraging habitat: shrubland with/without woodland species, laterite breakaways and minor drainage habitats; and
- Roosting habitat: open Eucalyptus forest and planted Eucalyptus habitats (planted roadside/property trees).

While no suitable breeding habitat was observed, the open Eucalyptus forest and planted Eucalyptus habitats contained younger age class trees, which may provide suitable breeding habitat in the future.

With the exception of existing areas of disturbance (i.e. fire breaks and agricultural land at the accommodation camp location) all habitat within the project area is recognised as foraging habitat for the Carnaby's Black Cockatoo. No roosting habitat is present within the project area.

## **Fauna**

The desktop assessment indicated that a total of 302 fauna species have been previously recorded in the region. These 302 species include 168 bird species, 29 mammal species, 94 reptile species and 11 amphibian species. This total also includes several marine bird species whose ranges are restricted to coastal or offshore regions and would not be expected to be found in the project area. A number of opportunistic fauna sightings were recorded during the field investigations including another two species previously not identified, increasing the total potential species list to 304 species.

Based on the desktop assessment, 20 fauna species of conservation significance have been identified as potentially occurring within the vicinity of the project area, including:

- Three species listed as Threatened under the EPBC Act;
- Thirteen species scheduled under the WC Act;
- Nine species listed as Priority fauna species by DPAW; and
- Five species listed as migratory species under the EPBC Act.

None of these species, nor evidence of these species, was recorded during field investigations. Of the 20 conservation significant fauna species, only four were considered "likely" to occur (Black Cockatoo, Australian Bustard, Rainbow Bee-eater and Western Carpet Python), and another four were considered as "possibly" occurring within the project area (Peregrine Falcon, Fork-tailed Swift, Western Brush Wallaby and Gilled Slender-Bluetongue). The Shield-backed Trapdoor Spider was not found during the field survey, most likely due to the absence of suitable habitat.

## **4.3. Heritage and conservation**

This section describes indigenous heritage, non-indigenous heritage and conservation areas within or in the vicinity of the project area.

### **4.3.1. Indigenous heritage**

The Aboriginal Heritage Inquiry System, maintained by the DAA, was examined for indigenous sites of archaeological and ethnographical significance in the project area (DAA, 2017). There are no registered sites within or in close proximity to the project area. The nearest site is located along the Irwin River, more than 15 km northwest of the project area.

A cultural heritage survey was conducted by Terra Rosa Cultural Resources Management, the Amangu Traditional Owners, the Yamatji Marlpa Aboriginal Corporation and Warrego Energy in February 2014 (Terra Rosa, 2014). The survey identified two restricted access areas, although both of these sites are located along Sand Plain Creek and occur outside the project area.

### **4.3.2. Non-indigenous heritage**

Coffey undertook a desktop assessment for non-indigenous heritage over the project area. A search of the Australian Heritage Database did not identify any heritage sites of significance in the local area (AHD, 2012). The nearest non-indigenous heritage sites are located at least 30 km from the project area.

### **4.3.3. Conservation areas and environmentally sensitive features**

The Lesueur Sandplain subregion has largely been cleared for grazing and agricultural purposes. Approximately 70% of the subregion is currently cleared farmland used for dry-land agriculture (Desmond & Chant, 2001).

Conservation areas are predominantly concentrated in the western areas of the subregion, with the most significant conservation areas directly south of Dongara (see Figure 1.1) (Desmond & Chant, 2001).

The closest conservation areas to the project area are:

- Wilson Nature Reserve, which covers about 1,100 ha and is approximately 15 km southeast of the project area;
- Yandanogo Nature Reserve, which covers about 6,500 ha and is approximately 19 km west of the project area; and
- Beekeepers Nature Reserve, which covers about 120,000 ha and is approximately 29 km to the west of the project area.

## **4.4. Socio-economic environment**

The project area is located within the Shire of Three Springs on private property and VCL. Roads in reasonable proximity to the project area include Tomkins Road to the south, Natta Road to the east and Yandanooka West Road to the north.

The main industries within the Shire of Three Springs are farming (grain production and livestock grazing), mining, and government-based operations. With regards to mining, the shire hosts the largest talc mine in the southern hemisphere. The mine has been in operation since 1948 and is the largest employer in the shire (Shire of Three Springs, 2011). The Shire of Three Springs has a population of 631 (ABS, 2014).

The townships of Port Denison and Dongara to the northwest of the project area are the closest population centres. The city of Geraldton approximately 100 km to the north of the project area is the closest major population centre, with a population of 39,311 (ABS, 2014).

## 5. Environmental management strategies

### 5.1. Environmental risk assessment

This section details the method used in the environmental risk assessment for the project.

#### 5.1.1. Risk assessment method

The environmental hazard identification and risk assessment process applied to the project is based on Warrego Energy's internal environmental risk assessment method and the principles of AS/NZS 31000:2009 and HB 203:2012. Key steps in this process include:

- identifying aspects of the project that may have an impact upon the environment;
- describing the potential environmental impacts if no mitigation measures are in place;
- assigning a realistic worst-case consequence rating to the impact;
- assessing the likelihood of the impact with the consequence assigned;
- determining a risk score for each impact;
- classifying the residual impact as a low, medium or high risk;
- identifying practical controls and mitigation measures for each risk;
- reassessing the consequence, likelihood and risk score for each risk with mitigations measures in place (i.e. determine the residual risk).

The management practices identified are designed to keep risks to ALARP and economically achievable. ALARP is defined in the Guideline for the Development of Petroleum and Geothermal Environment Plans in Western Australia as (DMP, 2016a):

*the point where the cost involved in further reducing the environmental impacts and risks of the activity would be highly disproportionate to the environmental benefit gained. This principle arises from the reality that resources are finite and should focus on reducing the environmental impacts and/or risks that will deliver the best environmental outcomes possible.*

Before any activity is commenced:

- the appropriate level of approval must be given and recorded; and
- defined controls must be communicated, any physical arrangements put in place and verified and competent personnel assigned to the activity.

#### 5.1.2. Assessment of environmental risks

The qualitative risk assessment undertaken by Warrego Energy and its consultants is based on experiences with similar exploration wells, site knowledge, desktop data and information, stakeholder consultation and professional judgement. Risks have been identified for each activity of the project, including the identification of risks from non-routine activities or incidents.

A total of 37 hazards were identified during the systematic hazard identification assessment. Following assessment of applicable mitigation measures, five of these hazards were characterised

'medium' and 32 characterised as 'low' residual risks. As no 'high' residual risks were identified, the 'medium' residual risks can be considered the key risk factors for the project.

The full risk assessment is provided in Appendix B, which includes a full list of the relevant controls and mitigations for each risk/impact.

## 5.2. Environmental management strategies

Environmental management strategies have been prepared for each environmental aspect of the project (mobilisation, drilling (operations), operation of site facilities, stakeholder management, well suspension and rehabilitation) to present:

- activities associated with the environmental aspect;
- an assessment of initial or inherent risks (see section 5.1);
- potential environmental impacts;
- controls and mitigations to reduce the risk;
- an assessment of residual risks;
- the acceptability of risks and how risks have been reduced to ALARP;
- environmental performance criteria for each risk or group of risks (see section 5.2), including:
  - performance objectives;
  - performance standards; and
  - measurement criteria;
- systems and procedures applying to the environmental aspect and/or activities;
- monitoring; and
- records.

The environmental management strategies are contained in Appendix C. Environmental management strategies have been developed for each environmental aspect and the activities associated with them:

1. Mobilisation, demobilisation and site preparation:
  - a. vehicle and equipment/plant movement;
  - b. planned vegetation clearing and earthworks and unplanned vegetation clearing; and
  - c. presence of project team.
2. Drilling (i.e. operations):
  - a. cuttings and fluids in sumps and pits;
  - b. well blow out;
  - c. unplanned release of drilling muds and hydrocarbons from well; and
  - d. vehicle and equipment/plant movement.
3. Operation of site facilities:
  - a. generation, storage and removal of wastes;
  - b. storage of chemicals, hazardous materials and dangerous goods; and
  - c. facility lighting and noise.
4. Well suspension:
  - a. loss of well control and third party access.
5. Rehabilitation:
  - a. rehabilitation not carried out properly or completion criteria not met.
6. Stakeholder management:
  - a. unauthorised access to property, presence of project team and failure to engage stakeholders.

## 6. Implementation strategy

This chapter outlines how Warrego Energy will implement this EP and the management practices contained within it, including:

- systems, practices and procedures for implementing this EP;
- roles and responsibilities of personnel to ensure that the EP is implemented;
- training and competencies required of personnel;
- oil spill response plan;
- monitoring, auditing and management of non-conformances;
- record keeping;
- reporting and notification arrangements; and
- review of this EP.

### 6.1. Systems, practices and procedures

A range of systems, practices and procedures will be used during the project. Each system, practice and procedure defines a standard process to be used for a particular activity (or activities) and ensures that the commitments in this EP are implemented consistently.

Table 6.1 lists a summary of the systems, practices and procedures that relate to the implementation of this EP. Some documents listed may serve a dual purpose by managing other non-environment aspects of the project (e.g. safety).

A number of the systems, practices and procedures may be partially or completely owned by project contractors. These will be further defined in the applicable contractor bridging documents and interface plans with Warrego Energy. Certain contractors will be required by Warrego Energy to have or develop appropriate systems, practices and procedures for their specialist activities. These may include some of the documents listed in Table 6.1. These documents will be reviewed and approved by Warrego Energy to check that the contractor is able to meet the requirements of this EP.

**Table 6.1 List of systems, practices and procedures for the project**

| System, practice or procedure                        | Purpose                                                                                                                                            |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Systems</b>                                       |                                                                                                                                                    |
| HSEQ Manual                                          | Documents the HSEQ system to be used for the project.                                                                                              |
| <b>Policies and standards</b>                        |                                                                                                                                                    |
| Contractor bridging documents and/or interface plans | Defines how Warrego Energy's requirements for project implementation are met through contractors' own procedures and standards.                    |
| Emergency Response Plan                              | Details the steps to be taken in the event of an emergency.                                                                                        |
| Oil Spill Response Plan                              | Details how oil and other hydrocarbon spills will be responded to.                                                                                 |
| Rehabilitation Management Plan                       | Sets out rehabilitation arrangements following completion of operations, including monitoring requirements and rehabilitation completion criteria. |
| Dieback and Weed Management Plan                     | Details steps to be taken to avoid the introduction and spread of dieback and weeds in the project area.                                           |
| Stakeholder Management Plan                          | Details communication with stakeholders (e.g., which stakeholders, how often, on which topics, the method of communication, etc.).                 |

| System, practice or procedure                                 | Purpose                                                                                                                                                                                    |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stakeholder consultation register                             | Records interactions and communications with stakeholders, landholders and government agencies.                                                                                            |
| Traffic Management Plan (if required?)                        | Describes how project traffic will be managed, particularly in the VCL.                                                                                                                    |
| Vehicle Use Procedure                                         | Describes how vehicles may and may not be used in the project area, including the use of the daily checklist.                                                                              |
| Journey Management Procedure                                  | Details the steps to be taken when planning journeys related to the project.                                                                                                               |
| Waste Collection, Storage and Disposal Procedure              | Details the process for ensuring that all project waste is captured, segregated, stored and disposed of.                                                                                   |
| Handling Oil and Oily Waste                                   | Details special management requirements for oils and oily wastes.                                                                                                                          |
| Hydraulic Hoses Procedure                                     | Details the management of hydraulic hoses on vehicles and machinery, including inspections and maintenance.                                                                                |
| Permit to Work Procedure                                      | Details the process of obtaining an internal permit to conduct certain types of high-risk work. Permits typically require a higher level of management to ensure that risks are minimised. |
| Vehicle Convoy Procedure                                      | Details how vehicles must be operated when travelling in convoy, including any traffic management arrangements that may need to be considered.                                             |
| Spot Fire Response and Emergency Evacuation – Field Procedure | Details the standard procedures for dealing with fires and evacuations while in the field. Steps from this procedure will be incorporated into the project-specific ERP.                   |
| Refuelling Using Fuel Trailer Procedure                       | Sets out standard steps to be followed when conducting refuelling operations in the field.                                                                                                 |
| Gate Management Procedure                                     | Details how gates on access roads, roads and private property will be managed.                                                                                                             |
| Road Crossing With Off-road Plant Procedure                   | Details how off-road vehicles and machinery will cross public access roads.                                                                                                                |
| Hygiene station procedure                                     | Describes how the hygiene station will be sited and operated.                                                                                                                              |
| Dangerous Goods Storage Procedure                             | Describes how dangerous goods and hazardous materials will be stored.                                                                                                                      |
| Induction Procedure                                           | Sets out the process for inducting all personnel working on the project or visiting the well site.                                                                                         |
| Internal Audit Plan                                           | Details the requirements for internal audits including timing and scope.                                                                                                                   |

## 6.2. Inductions, Training and Competencies

Employee and contractor awareness of correct environmental management will be critical to the environmental success of the project. All Warrego Energy employees and contractors will therefore complete site-specific project inductions before being permitted to commence any work on site.

Inductions will address environmental management, inductee obligations, and project-specific environmental management procedures, roles, responsibilities and lines of communication.

Environmental topics will include:

- Warrego Energy's HSEQ policy;
- project scope;
- DMP's role as regulator for petroleum activities;
- environmental sensitivities (e.g., flora and fauna, water, soil and landforms, emissions, heritage, landowners);
- key environmental aspects and management measures for the project;
- waste management;
- biosecurity management (i.e., weed and disease control);
- fire prevention and response;
- incident reporting;
- spill response procedures;
- site access and journey management;
- procedures if a heritage site (suspected or otherwise) are uncovered;
- reporting and recording requirements;
- complaint management; and
- site rehabilitation procedures.

All contractors and personnel engaged in project operations will have access to this EP at all times. Inductions will be targeted towards the roles of the personnel involved. Certain inductions may therefore cover some topics in more detail than others.

Some contractors may be required to have particular certifications or licences (e.g., controlled waste disposal contractors).

Contractors will provide their own training registers and records to Warrego Energy prior to the commencement of project activities. The Operations Contractor Managers will be responsible for ensuring that personnel and sub-contractors possess the correct training and/or competencies for activities controlled by the contractor (e.g., for operating heavy machinery).

### **6.3. Oil spill response plan**

An OSRP developed in accordance with DMP's Guideline for the Development of an Onshore Oil Spill Contingency Plan (DMP, 2016b) will be finalised with the appointed drilling contractor and submitted as a separate document for approval by DMP.

The OSRP will describe potential spill scenarios, and potential response scenarios, procedures for responding to a spill, and provisions for testing the response procedures.

## **6.4. Monitoring, auditing and management of non-conformance**

### **6.4.1. Monitoring**

The Warrego Energy Asset Manager and Operations Contractor Managers will coordinate inspection of project activities during each phase of the project to assess compliance with this EP and coordinate any required review of the EP documentation and associated procedures.

Monitoring will be conducted to ensure that aspects of site preparation and operations are not having unintended environmental impacts. Monitoring will be conducted through the use of tools such as checklists and site walkovers. Examples of items to be monitored include sumps, storage areas, waste bins, drainage, groundwater quality and weeds. Corrective actions will be instigated for any items that are not in conformance with the requirements of this EP.

Dieback and weed monitoring will be conducted in accordance with Warrego Energy's approved DWMP. Warrego Energy will review the DWMP in the context of planned operations on WE-2. If any changes are required an adjusted plan will be submitted to the DMP prior to the commencement of drilling operations.

Rehabilitation monitoring will be conducted in accordance with Warrego Energy's approved Rehabilitation Management Plan (RMP). Warrego Energy will review the RMP in the context of planned operations on WE-2. If any changes are required an adjusted plan will be submitted to the DMP for approval prior to completion of project operations.

### **6.4.2. Auditing**

Warrego Energy will carry out internal audits against the commitments made within this EP to assess the effectiveness of the environmental management procedures. Any non-conformances identified during the inspections/audits will be managed through Warrego Energy's incident management system through a follow-up, action and close-out process.

Audits may also be used to assess the environmental performance of the project and identify possible improvements.

Audits of the project's compliance with all environmental approvals and permits (including this EP) will be undertaken in accordance with the following schedule:

- at least once during any of the drilling phases of the project;
- if the well is suspended pending further development, at least once during the suspension phase (i.e. after demobilisation but before rehabilitation or further development); and
- at least once after demobilisation and rehabilitation activities have both been completed.

Any incidents or identification of non-conformances during audits may trigger a review of this EP (see Section 6.8) to determine whether procedural controls need to be modified to minimise or avoid similar future non-conformances.

## **6.5. Record keeping**

During project activities, Warrego Energy and its contractors will maintain records relating to the environmental performance of the project. The following list details the types of environmental records that may be kept:

- records of daily activities;
- weekly/daily environmental inspection records;
- incident and hazard reporting records;
- energy and fuel usage records;
- waste and emissions records;
- land and vegetation disturbance records;
- water consumption and (if applicable) bore water quality records;
- hygiene station inspection records;
- results of audits;
- induction and training records;
- vehicle/equipment maintenance records; and
- hazardous material and chemical storage and use records.

Certain other reports and records are required to be made under the PGER (E) Regulations. These are detailed in the following section.

## **6.6. Review**

This EP will be reviewed if there is a significant change to the scope of the project not covered by this EP, or if required because of changes in the applicable legislative framework. The EP may also be reviewed as part of the correction of non-conformances identified in audits to assess if procedural controls need to be modified to minimise or avoid future occurrences.

Any new or modified activities or new or increased environmental risks not previously identified in an approved EP must also be approved by DMP before the activities related to the risks may be undertaken. Additional/changed activities and risks must be incorporated into a revised version of the EP. For minor changes, DMP may instead agree to the submission of a written notification or a bridging document.

## 7. Stakeholder consultation

Warrego Energy initiated a stakeholder consultation program in 2008 when it acquired exploration rights in EP 469. Since then, Warrego Energy has consulted with landholders, traditional owners, local government, state and federal government agencies and other stakeholders with regards to the WEEP.

Warrego Energy's Stakeholder Management Plan ensures that all stakeholder engagement processes are planned and developed in line with the requirements of the Petroleum and Geothermal Energy Resources (Environment) Regulations 2012, the DMP Guidelines for the Development of Petroleum and Geothermal Environment Plans (DMP EP Guidelines) in Western Australia (November 2016), APPEA land access framework, Ministerial Council on Mineral and Petroleum Resources Principles for Engagement with Communities and Stakeholder (2005) and industry best practice.

The Stakeholder Management Plan provides the stakeholder consultation and engagement processes that Warrego undertakes throughout the Project life cycle.

The aims of the Stakeholder Management Plan include:

- demonstrating Warrego Energy's commitment to protecting the environment and to maintaining public health and safety during all phases of the project, which can be achieved through effective stakeholder consultation.
- minimising or managing any actual, perceived or anticipated negative impacts of the project on stakeholders through effective and timely consultation that will allow stakeholder concerns and queries to be heard and addressed during each of the project phases from planning to implementation;
- minimising any long-term negative impacts of the project on stakeholders through ongoing respectful, open communication, consultation and consideration and addressing of concerns and queries; and
- maximising the positive impacts of the project on stakeholders through awareness and consideration of community benefits, use of local services and community involvement.

Warrego Energy's approach to stakeholder engagement and consultation has always been inclusive and open to ensure effective engagement resulting in positive and long term relationships with stakeholders. The stakeholder engagement and consultation to date aligns with the DMP EP Guidelines (Regulation 17). This includes, but is not limited to the following key principles of stakeholder engagement:

- **Communication:** Warrego Energy's consultation includes open and two-way communication which is honest and appropriate to the stakeholder and the activity being discussed. The clearly defined communication channels have demonstrated a positive consultation strategy with all Warrego stakeholders to date and enabled direct access by stakeholders to key nominated Warrego representatives to enable two-way communication and effective and appropriate timeframes for consultation and understanding of planned activities.
- **Transparency:** Transparency is a critical element of any stakeholder consultation process. Warrego Energy's stakeholder consultation processes ensure that all communication is transparent and open to ensure that both Warrego Energy and the stakeholder understand the planned activity, the proposed timeframe for the activities, potential risks and benefits, the processes required for the activity to occur, how it will be conducted and the rehabilitation or close out of that activity. All outcomes of consultation are recorded and made available to stakeholders to ensure that the information being captured from the consultation is accurate and reflective of both parties understanding of the discussion and any queries or outcomes.

- **Collaboration:** To date Warrego Energy has demonstrated a clear collaborative approach to stakeholder consultation. In accordance with the Stakeholder Management Plan identification of potential mutually beneficial outcomes and approaches to activities is a key aspect of the consultation approach. This cooperative and collaborative approach has enabled strong stakeholder relationships to continue throughout the various phases of the exploration activities and will continue. The collaboration between Warrego Energy and its stakeholders has enabled opportunities to be identified for positive or mutually beneficial outcomes and subsequently implemented.
- **Inclusiveness:** Warrego Energy's stakeholder engagement process commenced in 2008 and is an ongoing process of inclusiveness. Inclusion of stakeholders in the planning and preparation for activities and keeping stakeholders informed during the entire project life cycle have been a critical aspect of Warrego Energy's effective stakeholder consultation. Early engagement with stakeholders in the infancy of project phases and the continuation of that engagement and consultation has enabled strong stakeholder relationships to be developed; and
- **Integrity:** As with all key principles of stakeholder consultation and engagement, integrity is critical. Ensuring the Warrego Energy representatives engaging with stakeholders maintain an open and honest approach with integrity enables the development of a mutual respect and trust. Warrego Energy's established stakeholder relationships have clearly demonstrated that integrity is a critical aspect that is important to Warrego Energy and all the Warrego Energy representatives. Demonstration of ongoing effective, open, honest and respectful communication, engagement and consultation assist with developing and maintaining good stakeholder relationships for the long term.

Warrego Energy stakeholders have been and continue to be engaged throughout the development stages of the project and this consultation and communication will be continued and maintained throughout implementation of the project. The stakeholder engagement and consultation processes include the following steps:

- identification of potential impacts on stakeholders;
- determining the aims and objectives of the stakeholder engagement processes;
- identification of stakeholders and delegations of stakeholders into categories according to the level and type of potential impact, potential direct or indirect involvement in the activities, community interests or concerns;
- development of consultation tools, materials and information to appropriately and effectively inform the stakeholders in relation to the proposed and planned activities;
- undertaking stakeholder consultation in accordance with the Stakeholder Management Plan (which is regularly reviewed for currency and effectiveness), including documentation of stakeholder consultation processes, outcomes, actions, management strategies and solutions;
- incorporating outcomes of the stakeholder consultation processes into any relevant Referral documentation, Environment Plans or project implementation documentation;
- ensuring all personnel engaged in Warrego Energy operations and activities understand and respect stakeholder sensitivities and concerns;
- providing ongoing information to and receiving feedback and input from stakeholders throughout the implementation of the project life cycle.

All relevant stakeholders must be identified and properly consulted.

The Stakeholder Management Plan requires a comprehensive list of stakeholders consulted, the nature of the consultations and any key issues that arose during those consultations during project planning as well as processes for ongoing communication throughout the project life cycle.

Warrego Energy is committed to continuing the stakeholder consultation program while it has a presence in the region. To date, consultation has involved the following parties:

- Department of Mines and Petroleum – Native Vegetation Branch and Petroleum Branch.
- Department of Parks and Wildlife (formerly the Department of Environment and Conservation) – Species and Communities Branch and Environmental Management Branch.
- Office of the Environmental Protection Authority.
- Commonwealth Department of the Environment (formerly the Department of Sustainability, Environment, Water, Population and Communities).
- Department of Water.
- Department of Agriculture and Food.
- Department of Lands.
- Landgate.
- Office of the Appeals Convenor.
- Shire of Three Springs.
- Shire of Mingenew.
- Shire of Irwin.
- Department of Fires and Emergency Services.
- Amangu people.
- Yamatji Marlpa Aboriginal Corporation.
- Landholders: both directly impacted and surrounding the project area.
- Local Community Groups
- Origin Energy.
- AWE Limited.
- Norwest Energy NL.
- UIL Energy.
- Empire Oil and Gas NL.
- Tronox Limited.
- Pipeline operators DBP Transmission and APA Group.
- Greenrock Energy.
- APPEA.
- Mid-West Operators Group.


Warrego retains consultants KD.1 Pty Ltd (KD.1) to support its stakeholder consultation program in conjunction with Coffey. Warrego has been consulting with stakeholders regarding the drilling program since the commencement of their consultation processes in 2008. More detailed discussions regarding the drilling program commenced with stakeholder groups commenced in 2014 15 during the conclusion of the seismic program.

Stakeholder consultation with regard to land access, transport routes, access to water, ground water testing, camp locations, hygiene requirements, project timeframes and various levels of approvals in preparation for the implementation of the drilling program is ongoing.

Warrego will continue stakeholder consultation in accordance with the Stakeholder Management Plan in advance of, during and following project activities to ensure project awareness, understanding of

concerns and ensuring ongoing positive and two way effective communication to ensure the successful implementation of the project and ongoing positive relationships

Warrego Energy also regularly liaises with oil and gas companies on neighbouring tenements to ensure that it keeps abreast of any issues that may be of concern to the local community.

| <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <b>Environmental Risk Assessment – West Erregulla-2 Exploration Well</b><br/>                     Warrego Energy<br/>                     West Erregulla Exploration Program                 </div> <div style="text-align: right;">  </div> </div> |                                                                                       |                                         |                                           |              |        |      |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------------------|--------------|--------|------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|------|
| No.                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ASPECT                                                                                | SOURCE OF RISK                          | IMPACTS                                   | INITIAL RISK |        |      | CONTROLS AND MITIGATIONS |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       | RESIDUAL RISK |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           | Cons.        | L'hood | Risk | No.                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Cons. | L'hood        | Risk |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Mobilisation/demobilisation and site preparation (inc. preliminary investigations)    | Vehicle and equipment/plant movement    | Introduction and spread of weeds/dieback. | 3            | 3      | 9    | 1.01                     | The Vacant Crown Land in the project area will be treated as dieback-free. A dieback and weed management plan will be implemented. Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks. Adhere to any applicable biosecurity requirements of landowners as per land access agreements. All personnel will be instructed on weed/disease risks and correct hygiene procedures.                                                                                                                                                                                                                                                        | 3     | 1             | 3    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 2.01                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 2.02                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 3.01                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 3.02                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Loss of conservation significant flora.                                               |                                         |                                           | 4            | 2      | 8    | 2.01                     | Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks. All personnel will be instructed on - conservation significant values and related responsibilities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 4     | 1             | 4    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 2.02                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 3.01                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 3.02                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Erosion of soil. Generation of dust.                                                  |                                         |                                           | 2            | 3      | 6    | 3.01                     | Vehicle speeds will be restricted within the project area. Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks. Consider dust suppression techniques such as watering if required. Screening or sheeting material (e.g. crushed rock) will be spread over the well site and access road.                                                                                                                                                                                                                                                                                                                                             | 2     | 1             | 2    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 3.02                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 3.03                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 3.04                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Fauna mortalities/disturbance.                                                        |                                         |                                           | 2            | 3      | 6    | 4.01                     | Vehicle speeds will be restricted within the project area. Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks. All personnel will be instructed on conservation significant values and related responsibilities. All activities other than drilling will be conducted during daylight hours only.                                                                                                                                                                                                                                                                                                                                   | 2     | 2             | 4    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 4.02                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 4.03                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 4.04                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Contamination of soil (e.g. in refuelling, hydraulic line bursts, spilt drums, etc.). |                                         |                                           | 2            | 4      | 8    | 5.01                     | Use drip trays, spill mats or equivalent while refuelling. Refuel, service and maintain vehicles and machinery at designated locations only. Remove and dispose of any contaminated material offsite to a licenced facility using a licensed contractor. Spill kits will be available during all refuelling operations. Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills. Implement bunding to capture spills where possible.                                                                                                                                                                                                                                   | 2     | 3             | 6    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 5.02                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 5.03                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 5.04                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 5.05                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 5.06                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Fire.                                                                                 |                                         |                                           | 4            | 3      | 12   | 6.01                     | Fire fighting equipment will be fitted to all machinery and equipment and all personnel will be appropriately trained in how to prevent and respond to fires. Appropriate fire response equipment and vehicles will be maintained on-site at all times during site preparation and operations. Permit smoking only in designated smoking areas. All vehicles and machinery will operate on diesel fuel. Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills. Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.                                                                      | 4     | 2             | 8    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 6.02                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 6.03                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 6.04                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 6.05                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 6.06                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Planned vegetation clearing and earthworks                                            | Loss of conservation significant flora. |                                           | 4            | 3      | 12   | 7.01                     | Clearing of native vegetation will be undertaken in accordance with Native Vegetation Clearing Permit CPS 5899/3 (or subsequent versions thereof) and other applicable permits/approvals. Known locations of Threatened flora will be avoided. Where possible, known locations of Priority 1 and Priority 2 flora will be avoided. Clearing of vegetation will be kept to the minimum reasonably considered necessary to construct the required facilities. Initial surveying using a GPS will be undertaken to accurately locate and demarcate all areas of disturbance and areas that need to be avoided. All personnel will be instructed on conservation significant values and related responsibilities.    | 4     | 1             | 4    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 7.02                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 7.03                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 7.04                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 7.05                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 7.06                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Loss of habitat for conservation significant fauna species.                           |                                         |                                           | 3            | 5      | 15   | 8.01                     | Clearing of native vegetation will be undertaken in accordance with Native Vegetation Clearing Permit CPS 5899/3 (or subsequent versions thereof) and other applicable permits/approvals. All trees with a diameter breast height (DBH) of 50 cm or greater will be avoided. No clearing will be undertaken outside the project area. Initial surveying using a GPS will be undertaken to accurately locate and demarcate all areas of disturbance and areas that need to be avoided. Clearing of vegetation will be kept to the minimum reasonably considered necessary to construct the required facilities. All personnel will be instructed on conservation significant values and related responsibilities. | 2     | 5             | 10   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 8.02                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 8.03                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 8.04                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 8.05                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                                         |                                           |              |        |      | 8.06                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |      |

| No. | ASPECT                     | SOURCE OF RISK                                                                       | IMPACTS                                                    | INITIAL RISK |        |      | CONTROLS AND MITIGATIONS |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       | RESIDUAL RISK |      |  |
|-----|----------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------|--------------|--------|------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|------|--|
|     |                            |                                                                                      |                                                            | Cons.        | L'hood | Risk | No.                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Cons. | L'hood        | Risk |  |
| 9   |                            |                                                                                      | Fragmentation of habitat.                                  | 2            | 3      | 6    | 9.01                     | All personnel will be instructed on - conservation significant values and related responsibilities. Clearing of vegetation will be kept to the minimum reasonably considered necessary to construct the required facilities.<br>Use existing tracks (e.g. fire breaks) in preference to clearing new tracks where possible.<br>A rehabilitation management plan will be implemented.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2     |               | 4    |  |
|     |                            |                                                                                      |                                                            |              |        |      | 9.02                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 9.03                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 9.04                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
| 10  |                            |                                                                                      | Fauna mortalities/disturbance.                             | 2            | 3      | 6    | 10.01                    | Vehicle speeds will be restricted within the project area.<br>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.<br>All personnel will be instructed on - conservation significant values and related responsibilities.<br>Pets and firearms will be prohibited in the project area.<br>All activities other than drilling will be conducted during daylight hours only.                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2     |               | 4    |  |
|     |                            |                                                                                      |                                                            |              |        |      | 10.02                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 10.03                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 10.04                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 10.05                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
| 11  |                            |                                                                                      | Alteration of surface water flows.                         | 2            | 2      | 4    | 11.01                    | A rehabilitation management plan will be implemented.<br>Stormwater pipes (2,000-3,000 mm) will be installed at low points along the road (if required).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2     | 1             | 2    |  |
|     |                            |                                                                                      |                                                            |              |        |      | 11.02                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
| 12  |                            |                                                                                      | Disturbance to indigenous or non-indigenous heritage site. | 3            | 2      | 6    | 12.01                    | All personnel will be instructed on heritage values and related responsibilities.<br>At least two Amangu monitors will be present on site during ground disturbing activities.<br>Adhere to CHMP and associated requirements of the <i>Aboriginal Heritage Act 1972</i> if a suspected Aboriginal heritage site is discovered.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3     | 1             | 3    |  |
|     |                            |                                                                                      |                                                            |              |        |      | 12.02                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 12.03                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
| 13  |                            |                                                                                      | Erosion of soil. Generation of dust.                       | 2            | 3      | 6    | 13.01                    | Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.<br>Vehicle speeds will be restricted within the project area.<br>Topsoil removed during preparation of the well site will be stockpiled for use during rehabilitation.<br>Topsoil stockpiles will be no more than 3 m high.<br>Screening or sheeting material (e.g. crushed rock) will be spread over the well site and access road.<br>Consider dust suppression techniques such as watering if required.<br>A rehabilitation management plan will be implemented.                                                                                                                                                                                                                                                                                                                  | 2     | 1             | 2    |  |
|     |                            |                                                                                      |                                                            |              |        |      | 13.02                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 13.03                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 13.04                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 13.05                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 13.06                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 13.07                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
| 14  |                            | Unplanned vegetation clearing (i.e. clearing outside of approved clearing footprint) | Loss of conservation significant flora.                    | 4            | 3      | 12   | 14.01                    | Initial surveying using a GPS will be undertaken to accurately locate and demarcate all areas of disturbance and areas that need to be avoided.<br>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.<br>All personnel will be instructed on conservation significant values and related responsibilities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3     | 1             | 3    |  |
|     |                            |                                                                                      |                                                            |              |        |      | 14.02                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 14.03                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
| 14  |                            | Presence of project team                                                             | Disruption to landowners.                                  | 3            | 2      | 6    | 14.01                    | Ensure any applicable landowner access agreements are in place before project commences.<br>All personnel will be instructed on landowner and stakeholder sensitivities and related responsibilities.<br>Adhere to stakeholder management plan.<br>Liaise with stakeholders during project activities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1     | 1             | 1    |  |
|     |                            |                                                                                      |                                                            |              |        |      | 14.02                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 14.03                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 14.04                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
| 15  | Drilling (i.e. operations) | Cuttings and fluids in sumps and pits                                                | Contamination of soil, surface water and/or groundwater.   | 2            | 3      | 6    | 15.01                    | Water-based muds (WBM) will be used.<br>Only DMP approved fluids and chemicals will be used.<br>Liquid chemicals, drilling muds or hazardous substances will be stored in a bund capable of holding 110% of the stored volume.<br>Cuttings from water-based drilling will be discharged in to a suitably lined receptacle located on the well site.<br>Sump and pit levels will be monitored for overflow during and after high rainfall.<br>Soil in sumps and pits will be tested for the presence of contaminants following completion of operations.<br>Contaminated material will be removed and disposed of offsite at a licenced facility.<br>Sump liners will be removed at the completion of project activities during demobilisation and rehabilitation activities prior to being backfilled.<br>Fencing between surrounding vegetation and sumps/pits will be installed (e.g. well site perimeter fencing). | 2     | 1             | 2    |  |
|     |                            |                                                                                      |                                                            |              |        |      | 15.02                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 15.03                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 15.04                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 15.05                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 15.06                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 15.07                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 15.08                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
| 16  |                            |                                                                                      | Fauna mortalities.                                         | 2            | 3      | 6    | 16.01                    | Sumps and pits will be provided with fauna egress points as recommended in DMP's guidance document <i>Fauna Egress Matting and Ramps</i> .<br>Sumps and pits will be monitored regularly for presence of fauna.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2     | 2             | 4    |  |
|     |                            |                                                                                      |                                                            |              |        |      | 16.02                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |
|     |                            |                                                                                      |                                                            |              |        |      | 16.03                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |      |  |

| No. | ASPECT                                                        | SOURCE OF RISK                                                    | IMPACTS | INITIAL RISK |        |       | CONTROLS AND MITIGATIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |             |       | RESIDUAL RISK |      |  |
|-----|---------------------------------------------------------------|-------------------------------------------------------------------|---------|--------------|--------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------|---------------|------|--|
|     |                                                               |                                                                   |         | Cons.        | L'hood | Risk  | No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Description | Cons. | L'hood        | Risk |  |
| 17  | Well blowout                                                  | Fire.<br>Contamination of soil, surface water and/or groundwater. | 5       | 5            | 25     | 17.01 | Drilling will be conducted according to an approved drilling plan by qualified drilling contractors in accordance with industry best practice standards and procedures.<br>The well head, pipework and containment vessels will be appropriately banded.<br>Hydrostatic control of the well will be maintained at all times.<br>The surface hole section of the well will be drilled using a diverter. Thereafter, a blowout preventer will be installed on the drilling rig during drilling.<br>Only DMP approved fluids and chemicals will be used.<br>Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills.<br>A groundwater monitoring program will be implemented via neighbouring bores.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5           | 1     | 5             |      |  |
|     |                                                               |                                                                   |         |              |        | 17.02 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 17.03 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 17.04 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 17.05 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 17.06 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 17.07 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
| 18  | Unplanned release of drilling muds and hydrocarbons from well | Contamination of soil, surface water and/or groundwater.          | 3       | 2            | 6      | 18.01 | Only DMP approved fluids and chemicals will be used.<br>Soil in sumps and pits will be tested for the presence of contaminants following completion of operations.<br>Contaminated material will be removed and disposed of offsite at a licensed facility.<br>A series of control valves (Christmas tree) will be installed at the surface as secondary barriers preventing the unwanted egress of formation fluids. The primary barrier will remain wellbore fluid density.<br>The well head, pipework and containment vessels will be appropriately banded.<br>Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills.<br>A groundwater monitoring program will be implemented via neighbouring bores.<br>Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills.<br>A 20 m fire break will be maintained around the well site during project activities.<br>Appropriate fire response equipment and vehicles will be maintained on-site at all times during operations.<br>Fire fighting equipment will be fitted to all machinery and equipment and all personnel will be appropriately trained in how to prevent and respond to fires.<br>Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills. | 3           | 1     | 3             |      |  |
|     |                                                               |                                                                   |         |              |        | 18.02 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 18.03 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 18.04 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 18.05 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 18.06 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 18.07 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
| 19  | Fire.                                                         | Greenhouse gas emissions.                                         | 4       | 3            | 12     | 19.01 | Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 4           | 1     | 4             |      |  |
|     |                                                               |                                                                   |         |              |        | 19.02 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 19.03 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 19.04 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
| 20  |                                                               |                                                                   | 2       | 2            | 4      | 20.01 | Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2           | 1     | 2             |      |  |
|     |                                                               |                                                                   |         |              |        |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
| 21  | Vehicle and equipment/plant movement and use                  | Introduction and spread of weeds/dieback.                         | 3       | 3            | 9      | 21.01 | The Vacant Crown Land in the project area will be treated as dieback-free.<br>A dieback and weed management plan will be implemented.<br>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.<br>Adhere to any applicable biosecurity requirements of landowners as per land access agreements.<br>All personnel will be instructed on weed/disease risks and correct hygiene procedures.<br>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.<br>All personnel will be instructed on conservation significant values and related responsibilities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 3           | 1     | 3             |      |  |
|     |                                                               |                                                                   |         |              |        | 21.02 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 21.03 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 21.04 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 21.05 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
| 22  | Loss of conservation significant flora.                       |                                                                   | 4       | 2            | 8      | 22.01 | Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.<br>All personnel will be instructed on conservation significant values and related responsibilities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4           | 1     | 4             |      |  |
|     |                                                               |                                                                   |         |              |        | 22.02 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
| 23  | Erosion of soil.<br>Generation of dust.                       |                                                                   | 2       | 3            | 6      | 23.01 | Vehicle speeds will be restricted within the project area.<br>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.<br>Consider dust suppression techniques such as watering if required.<br>Screening or sheeting material (e.g. crushed rock) will be spread over the well site and access road.<br>Vehicle speeds will be restricted within the project area.<br>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.<br>All personnel will be instructed on conservation significant values and related responsibilities.<br>All activities other than drilling will be conducted during daylight hours only.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2           | 1     | 2             |      |  |
|     |                                                               |                                                                   |         |              |        | 23.02 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 23.03 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 23.04 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
| 24  | Fauna mortalities/disturbance.                                |                                                                   | 2       | 3            | 6      | 24.01 | Vehicle speeds will be restricted within the project area.<br>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.<br>All personnel will be instructed on conservation significant values and related responsibilities.<br>All activities other than drilling will be conducted during daylight hours only.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2           | 2     | 4             |      |  |
|     |                                                               |                                                                   |         |              |        | 24.02 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 24.03 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |
|     |                                                               |                                                                   |         |              |        | 24.04 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |       |               |      |  |

| No. | ASPECT                                                     | SOURCE OF RISK                                                                                      | IMPACTS                                                                                                                                                     | INITIAL RISK |        |       | CONTROLS AND MITIGATIONS                                                                                       |                                                                                                                                                               |       | RESIDUAL RISK |      |  |
|-----|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------|-------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|------|--|
|     |                                                            |                                                                                                     |                                                                                                                                                             | Cons.        | L'hood | Risk  | No.                                                                                                            | Description                                                                                                                                                   | Cons. | L'hood        | Risk |  |
| 25  |                                                            |                                                                                                     | Contamination of soil (e.g. in refuelling, hydraulic line bursts, spill drums, etc.).                                                                       | 2            | 4      | 8     | 25.01                                                                                                          | Use drip trays, spill mats or equivalent while refuelling.                                                                                                    | 2     | 3             | 6    |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 25.02                                                                                                          | Refuel, service and maintain vehicles and machinery at designated locations only.                                                                             |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 25.03                                                                                                          | Contaminated material will be removed and disposed of offsite at a licenced facility.                                                                         |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 25.04                                                                                                          | Spill kits will be available during all refuelling operations.                                                                                                |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 25.05                                                                                                          | Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills.                                                            |       |               |      |  |
| 26  |                                                            |                                                                                                     | Fire.                                                                                                                                                       | 4            | 3      | 12    | 26.01                                                                                                          | Fire fighting equipment will be fitted to all machinery and equipment and all personnel will be appropriately trained in how to prevent and respond to fires. | 4     | 2             | 8    |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 26.02                                                                                                          | Appropriate fire response equipment and vehicles will be maintained on-site at all times during operations.                                                   |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 26.03                                                                                                          | Permit smoking only in designated smoking areas.                                                                                                              |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 26.04                                                                                                          | All vehicles and machinery will operate on diesel fuel.                                                                                                       |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 26.05                                                                                                          | Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills.                                                            |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 26.06                                                                                                          | Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.                              |       |               |      |  |
| 27  | Operation of site office facilities and accommodation camp | Generation, storage and removal of wastes                                                           | Attraction of fauna to waste receptacles.<br>Rubbish from project left on site.<br>Contamination of soil or groundwater (e.g. spills from sewage systems.). | 1            | 4      | 4     | 27.01                                                                                                          | All putrescible waste will be stored in bins that have a tightly secured lid to avoid fauna attraction and entry.                                             | 1     | 2             | 2    |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 27.02                                                                                                          | Fencing between surrounding vegetation and sumps/pits will be installed (e.g. well site perimeter fencing).                                                   |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 27.03                                                                                                          | Refuel, service and maintain vehicles and machinery at designated locations only.                                                                             |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 27.04                                                                                                          | Contaminated material will be removed and disposed of offsite at a licenced facility.                                                                         |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 27.05                                                                                                          | Sewage and any other controlled waste will be contained and removed and disposed of offsite using a licenced contractor.                                      |       |               |      |  |
| 28  |                                                            | Storage of chemicals, hazardous materials, dangerous goods, etc.                                    | Fire.<br>Contamination of soil, surface water and/or groundwater.                                                                                           | 4            | 2      | 8     | 28.01                                                                                                          | Liquid chemicals, drilling muds or hazardous substances will be stored in a bund capable of holding 110% of the stored volume.                                | 4     | 1             | 4    |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 28.02                                                                                                          | Dangerous goods will be stored in accordance with applicable legislation.                                                                                     |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 28.03                                                                                                          | Dangerous goods will be stored and managed by licenced contractors.                                                                                           |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 28.04                                                                                                          | Spill kits will be available in areas where dangerous goods and hazardous materials are stored.                                                               |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 28.05                                                                                                          | Permit smoking only in designated smoking areas.                                                                                                              |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 28.06                                                                                                          | Contaminated material will be removed and disposed of offsite at a licenced facility.                                                                         |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 28.07                                                                                                          | Fire fighting equipment will be fitted to all machinery and equipment and all personnel will be appropriately trained in how to prevent and respond to fires. |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 28.08                                                                                                          | Appropriate fire response equipment and vehicles will be maintained on-site at all times during operations.                                                   |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 28.09                                                                                                          | The emergency response plan (ERP) and oil spill response plan (OSRP) will be tested periodically.                                                             |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 28.10                                                                                                          | A 20 m fire break will be maintained around the well site during project activities.                                                                          |       |               |      |  |
| 29  |                                                            | Facility lighting                                                                                   | Disturbance to fauna.                                                                                                                                       | 1            | 4      | 4     | 29.01                                                                                                          | Set up facility lighting to minimise light spill into adjacent areas.                                                                                         | 1     | 3             | 3    |  |
| 30  |                                                            | Noise                                                                                               | Disturbance to fauna and surrounding landholders.                                                                                                           | 1            | 2      | 2     | 30.01                                                                                                          | Ensure vehicles and machinery have standard emission control devices fitted and maintained.                                                                   | 1     | 2             | 2    |  |
| 31  | Well suspension                                            | Loss of well control                                                                                | Fire.<br>Contamination of soil, surface water and/or groundwater.                                                                                           | 5            | 2      | 10    | 31.01                                                                                                          | Well will be suspended in accordance with relevant regulations.                                                                                               | 5     | 1             | 5    |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 31.02                                                                                                          | A 20 m fire break will be maintained around the well site during project activities.                                                                          |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 31.03                                                                                                          | A groundwater monitoring program will be implemented via neighbouring bores.                                                                                  |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        |       | 31.04                                                                                                          | The well site will be inspected regularly during well suspension using physical and remote monitoring methods.                                                |       |               |      |  |
| 32  | Third party access                                         | Damage to well infrastructure.<br>Fire.<br>Contamination of soil, surface water and/or groundwater. | 5                                                                                                                                                           | 2            | 10     | 32.01 | Well site fencing will be retained during well suspension to prevent third party access.                       | 1                                                                                                                                                             | 3     | 3             |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        | 32.02 | The well site will be inspected regularly during well suspension using physical and remote monitoring methods. |                                                                                                                                                               |       |               |      |  |
|     |                                                            |                                                                                                     |                                                                                                                                                             |              |        | 32.03 | All vehicles, equipment, plant and materials will be removed from the well site during well suspension.        |                                                                                                                                                               |       |               |      |  |

| No. | ASPECT                         | SOURCE OF RISK                                                                                                                                  | IMPACTS                                                                                                                                                   | INITIAL RISK |        |      | CONTROLS AND MITIGATIONS |                                                                                                             |       | RESIDUAL RISK |      |  |
|-----|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------|------|--------------------------|-------------------------------------------------------------------------------------------------------------|-------|---------------|------|--|
|     |                                |                                                                                                                                                 |                                                                                                                                                           | Cons.        | L'hood | Risk | No.                      | Description                                                                                                 | Cons. | L'hood        | Risk |  |
| 33  | Rehabilitation                 | Rehabilitation not carried out properly or in a timely manner.<br>Completion criteria not met.                                                  | Vegetation in disturbance footprint not rehabilitating.                                                                                                   | 2            | 2      | 4    | 33.01                    | A rehabilitation management plan will be implemented.                                                       | 2     | 1             | 2    |  |
|     |                                |                                                                                                                                                 |                                                                                                                                                           |              |        |      | 33.02                    | Rehabilitation of the well site will commence as soon as practicable (assuming well is no longer required). |       |               |      |  |
| 34  | Stakeholder management         | Unauthorised or improper access to properties                                                                                                   | Unauthorised land access by project personnel.<br>Breach of landowner agreements.<br>Damage to landowner infrastructure.<br>Complaints about the project. | 3            | 3      | 9    | 34.01                    | Ensure any applicable landowner access agreements are in place before project commences.                    | 3     | 1             | 3    |  |
|     |                                |                                                                                                                                                 |                                                                                                                                                           |              |        |      | 34.02                    | All personnel will be instructed on landowner and stakeholder sensitivities and related responsibilities.   |       |               |      |  |
|     |                                |                                                                                                                                                 |                                                                                                                                                           |              |        |      | 34.03                    | Adhere to stakeholder management plan.                                                                      |       |               |      |  |
|     |                                |                                                                                                                                                 |                                                                                                                                                           |              |        |      | 34.04                    | Liaise with stakeholders during project activities.                                                         |       |               |      |  |
| 35  | Presence of project team       | Disruption to landowners.                                                                                                                       | Disruption to landowners.                                                                                                                                 | 2            | 5      | 10   | 35.01                    | Ensure any applicable landowner access agreements are in place before project commences.                    | 1     | 3             | 3    |  |
|     |                                |                                                                                                                                                 |                                                                                                                                                           |              |        |      | 35.02                    | All personnel will be instructed on landowner and stakeholder sensitivities and related responsibilities.   |       |               |      |  |
|     |                                |                                                                                                                                                 |                                                                                                                                                           |              |        |      | 35.03                    | Adhere to stakeholder management plan.                                                                      |       |               |      |  |
|     |                                |                                                                                                                                                 |                                                                                                                                                           |              |        |      | 35.04                    | Liaise with stakeholders during project activities.                                                         |       |               |      |  |
| 36  |                                | Additional vehicles on local roads.<br>Disruption to traffic.<br>Disruption to local residents.                                                 | Disruption to local residents.                                                                                                                            | 3            | 4      | 12   | 36.01                    | Implement a traffic management plan (approved by local shire) where required.                               | 1     | 3             | 3    |  |
|     |                                |                                                                                                                                                 |                                                                                                                                                           |              |        |      | 36.02                    | Adhere to stakeholder management plan.                                                                      |       |               |      |  |
| 37  | Failure to engage stakeholders | Negative community sentiment resulting in complaints about the project or future difficulties in obtaining social licence for similar projects. | Negative community sentiment resulting in complaints about the project or future difficulties in obtaining social licence for similar projects.           | 3            | 3      | 9    | 37.01                    | Adhere to stakeholder management plan.                                                                      | 2     | 2             | 4    |  |
|     |                                |                                                                                                                                                 |                                                                                                                                                           |              |        |      | 37.02                    | All personnel will be instructed on landowner and stakeholder sensitivities and related responsibilities.   |       |               |      |  |
|     |                                |                                                                                                                                                 |                                                                                                                                                           |              |        |      | 37.03                    | Liaise with stakeholders during project activities.                                                         |       |               |      |  |

**Appendix B Environmental Management Strategies Relating to Environmental Risk Assessment**

| Environmental Aspect: Mobilisation, demobilisation and well site preparation          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                    |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
| Activities                                                                            | Vehicle and equipment/plant movement                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                    |
| Hazard                                                                                | <b>Inappropriate use of vehicle and/or equipment</b>                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                    |
| Inherent Risk Analysis and Ranking                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                    |
| Potential Environmental Impact                                                        | Consequence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Likelihood | Inherent Risk      |
| Introduction and spread of weeds and dieback.                                         | <b>3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>3</b>   | <b>9 (Medium)</b>  |
| Loss of conservation significant flora                                                | <b>4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>2</b>   | <b>8 (Medium)</b>  |
| Erosion of soil and generation of dust                                                | <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>3</b>   | <b>6 (Medium)</b>  |
| Fauna mortalities/ disturbance.                                                       | <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>3</b>   | <b>6 (Medium)</b>  |
| Contamination of soil (e.g. in refuelling, hydraulic line bursts, spilt drums, etc.). | <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>4</b>   | <b>8 (Medium)</b>  |
| Fire                                                                                  | <b>4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>3</b>   | <b>12 (Medium)</b> |
| Mitigation Measures (Control to Reduce Likelihood)                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                    |
| Introduction and spread of weeds and dieback.                                         | <p>The Vacant Crown Land in the project area will be treated as dieback-free.</p> <p>A dieback and weed management plan will be implemented.</p> <p>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.</p> <p>Adhere to any applicable biosecurity requirements of landowners as per land access agreements.</p> <p>All personnel will be instructed on weed/disease risks and correct hygiene procedures.</p> |            |                    |
| Loss of conservation significant flora                                                | <p>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.</p> <p>All personnel will be instructed on - conservation significant values and related responsibilities.</p>                                                                                                                                                                                                                                           |            |                    |
| Erosion of soil and generation of dust.                                               | <p>Vehicle speeds will be restricted within the project area.</p> <p>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.</p> <p>Screening or sheeting material (e.g. crushed rock) will be spread over the well site and access road.</p> <p>Consider dust suppression techniques such as watering if required.</p>                                                                                             |            |                    |
| Fauna mortalities/ disturbance.                                                       | <p>Vehicle speeds will be restricted within the project area.</p> <p>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.</p> <p>All personnel will be instructed on conservation significant values and related responsibilities.</p> <p>All activities other than drilling will be conducted during daylight hours only.</p>                                                                                   |            |                    |
| Contamination of soil (e.g. in refuelling, hydraulic line bursts, spilt drums, etc.). | <p>Use drip trays, spill mats or equivalent while refuelling.</p> <p>Refuel, service and maintain vehicles and machinery at designated</p>                                                                                                                                                                                                                                                                                                                                                   |            |                    |

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | <p>locations only.</p> <p>Remove and dispose of any contaminated material offsite to a licenced facility using a licensed contractor.</p> <p>Spill kits will be available during all refuelling operations.</p> <p>Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills.</p> <p>Implement bunding to capture spills where possible.</p>                                                                                                                                                                                                                                                                                                 |
| Fire | <p>Firefighting equipment will be fitted to all machinery and equipment and all personnel will be appropriately trained in how to prevent and respond to fires.</p> <p>Appropriate fire response equipment and vehicles will be maintained on-site at all times during site preparation and operations.</p> <p>Permit smoking only in designated smoking areas.</p> <p>All vehicles and machinery will operate on diesel fuel.</p> <p>Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills.</p> <p>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.</p> |

#### Residual Risk and Analysis and Ranking

| Potential Environmental Impact                                                        | Consequence | Likelihood | Residual Risk     |
|---------------------------------------------------------------------------------------|-------------|------------|-------------------|
| Introduction and spread of weeds and dieback.                                         | <b>3</b>    | <b>1</b>   | <b>3 (Low)</b>    |
| Loss of conservation significant flora                                                | <b>4</b>    | <b>1</b>   | <b>4 (Low)</b>    |
| Erosion of soil and generation of dust                                                | <b>2</b>    | <b>1</b>   | <b>2 (Low)</b>    |
| Fauna mortalities/ disturbance.                                                       | <b>2</b>    | <b>2</b>   | <b>4 (Low)</b>    |
| Contamination of soil (e.g. in refuelling, hydraulic line bursts, spilt drums, etc.). | <b>2</b>    | <b>3</b>   | <b>6 (Medium)</b> |
| Fire                                                                                  | <b>4</b>    | <b>2</b>   | <b>8 (Medium)</b> |

**Table 1b Environmental Management Strategies Relating to Environmental Risk Assessment**

| Environmental Aspect: Mobilisation, demobilisation and site preparation |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                    |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
| Activities                                                              | Planned and unplanned vegetation clearing and earthworks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                    |
| Hazard                                                                  | <b>Inappropriate vegetation clearing</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                    |
| Inherent Risk Analysis and Ranking                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                    |
| Potential Environmental Impact                                          | Consequence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Likelihood | Inherent Risk      |
| <b>Planned vegetation clearing</b>                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                    |
| Loss of conservation significant flora.                                 | <b>4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>3</b>   | <b>12 (Medium)</b> |
| Loss of habitat for conservation significant fauna species.             | <b>3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>5</b>   | <b>15 (High)</b>   |
| Fragmentation of habitat.                                               | <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>3</b>   | <b>6 (Medium)</b>  |
| Fauna mortalities/disturbance.                                          | <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>3</b>   | <b>6 (Medium)</b>  |
| Alteration of surface water flows.                                      | <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>2</b>   | <b>4 (Low)</b>     |
| Disturbance to indigenous or non-indigenous heritage site.              | <b>3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>2</b>   | <b>6 (Medium)</b>  |
| Erosion of soil. Generation of dust.                                    | <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>3</b>   | <b>6 (Medium)</b>  |
| <b>Unplanned vegetation clearing</b>                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                    |
| Loss of conservation significant flora.                                 | <b>4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>3</b>   | <b>12 (Medium)</b> |
| Mitigation Measures (Control to Reduce Likelihood)                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                    |
| <b>Planned vegetation clearing</b>                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                    |
| Loss of conservation significant flora.                                 | <p>Clearing of native vegetation will be undertaken in accordance with Native Vegetation Clearing Permit CPS 5899/3 (or subsequent versions thereof) and other applicable permits/approvals.</p> <p>Known locations of Threatened flora will be avoided.</p> <p>Where possible, known locations of Priority 1 and Priority 2 flora will be avoided.</p> <p>Clearing of vegetation will be kept to the minimum reasonably considered necessary to construct the required facilities.</p> <p>Initial surveying using a GPS will be undertaken to accurately locate and demarcate all areas of disturbance and areas that need to be avoided.</p> <p>All personnel will be instructed on conservation significant values and related responsibilities.</p> |            |                    |
| Loss of habitat for conservation significant fauna species.             | <p>Clearing of native vegetation will be undertaken in accordance with Native Vegetation Clearing Permit CPS 5899/3 (or subsequent versions thereof) and other applicable permits/approvals.</p> <p>All trees with a diameter breast height (DBH) of 50 cm or greater will be avoided.</p> <p>No clearing will be undertaken outside the project area.</p> <p>Initial surveying using a GPS will be undertaken to accurately locate and demarcate all areas of disturbance and areas that need to be avoided.</p> <p>Clearing of vegetation will be kept to the minimum reasonably considered necessary to construct the required facilities.</p> <p>All personnel will be instructed on conservation significant values and</p>                        |            |                    |

|                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                      |
|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------|
|                                                            | related responsibilities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                      |
| Fragmentation of habitat.                                  | <p>All personnel will be instructed on - conservation significant values and related responsibilities.</p> <p>Clearing of vegetation will be kept to the minimum reasonably considered necessary to construct the required facilities.</p> <p>Use existing tracks (e.g. fire breaks) in preference to clearing new tracks where possible.</p> <p>A rehabilitation management plan will be implemented.</p>                                                                                                                                                                                                                          |                   |                      |
| Fauna mortalities/disturbance.                             | <p>Vehicle speeds will be restricted within the project area.</p> <p>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.</p> <p>All personnel will be instructed on - conservation significant values and related responsibilities.</p> <p>Pets and firearms will be prohibited in the project area.</p> <p>Site preparation will be planned for daylight hours only.</p>                                                                                                                                                                              |                   |                      |
| Alteration of surface water flows.                         | <p>A rehabilitation management plan will be implemented.</p> <p>Stormwater pipes (2,000–3,000 mm) will be installed at low points along the road (if required).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                      |
| Disturbance to indigenous or non-indigenous heritage site. | <p>All personnel will be instructed on heritage values and related responsibilities.</p> <p>At least two Amangu monitors will be present on site during ground disturbing activities.</p> <p>Adhere to CHMP and associated requirements of the <i>Aboriginal Heritage Act 1972</i> if a suspected Aboriginal heritage site is discovered.</p>                                                                                                                                                                                                                                                                                       |                   |                      |
| Erosion of soil.<br>Generation of dust.                    | <p>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.</p> <p>Vehicle speeds will be restricted within the project area.</p> <p>Topsoil removed during preparation of the well site will be stockpiled for use during rehabilitation.</p> <p>Topsoil stockpiles will be no more than 3 m high.</p> <p>Screening or sheeting material (e.g. crushed rock) will be spread over the well site and access road.</p> <p>Consider dust suppression techniques such as watering if required.</p> <p>A rehabilitation management plan will be implemented.</p> |                   |                      |
| <b>Unplanned vegetation clearing</b>                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                      |
| Loss of conservation significant flora.                    | <p>Initial surveying using a GPS will be undertaken to accurately locate and demarcate all areas of disturbance and areas that need to be avoided.</p> <p>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.</p> <p>All personnel will be instructed on conservation significant values and related responsibilities.</p>                                                                                                                                                                                                                             |                   |                      |
| <b>Residual Risk and Analysis and Ranking</b>              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                      |
| <b>Potential Environmental Impact</b>                      | <b>Consequence</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Likelihood</b> | <b>Residual Risk</b> |
| <b>Planned vegetation clearing</b>                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                      |
| Loss of conservation significant flora.                    | <b>4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>1</b>          | <b>4 (Low)</b>       |
| Loss of habitat for conservation                           | <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>5</b>          | <b>10 (Medium)</b>   |

|                                                            |   |   |         |
|------------------------------------------------------------|---|---|---------|
| significant fauna species.                                 |   |   |         |
| Fragmentation of habitat.                                  | 2 | 2 | 4 (Low) |
| Fauna mortalities/disturbance.                             | 2 | 2 | 4 (Low) |
| Alteration of surface water flows.                         | 2 | 1 | 2 (Low) |
| Disturbance to indigenous or non-indigenous heritage site. | 3 | 1 | 3 (Low) |
| Erosion of soil. Generation of dust.                       | 2 | 1 | 2 (Low) |
| <b>Unplanned vegetation clearing</b>                       |   |   |         |
| Loss of conservation significant flora.                    | 4 | 1 | 4 (Low) |

**Table 1c Environmental Management Strategies Relating to Environmental Risk Assessment**

| Environmental Aspect:                              |                                                                                                                                                                                                                                                                                                                           |            |                   |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------|
| Activities                                         | Presence of project team                                                                                                                                                                                                                                                                                                  |            |                   |
| Hazard                                             | <b>Inappropriate behaviour</b>                                                                                                                                                                                                                                                                                            |            |                   |
| Inherent Risk Analysis and Ranking                 |                                                                                                                                                                                                                                                                                                                           |            |                   |
| Potential Environmental Impact                     | Consequence                                                                                                                                                                                                                                                                                                               | Likelihood | Inherent Risk     |
| Disruption to landowners                           | <b>3</b>                                                                                                                                                                                                                                                                                                                  | <b>2</b>   | <b>6 (Medium)</b> |
| Mitigation Measures (Control to Reduce Likelihood) |                                                                                                                                                                                                                                                                                                                           |            |                   |
| Disruption to landowners                           | <p>Ensure any applicable landowner access agreements are in place before project commences.</p> <p>All personnel will be instructed on landowner and stakeholder sensitivities and related responsibilities.</p> <p>Adhere to stakeholder management plan.</p> <p>Liaise with stakeholders during project activities.</p> |            |                   |
| Residual Risk and Analysis and Ranking             |                                                                                                                                                                                                                                                                                                                           |            |                   |
| Potential Environmental Impact                     | Consequence                                                                                                                                                                                                                                                                                                               | Likelihood | Residual Risk     |
| Disruption to landowners                           | <b>1</b>                                                                                                                                                                                                                                                                                                                  | <b>1</b>   | <b>1 (Low)</b>    |

**Table 1 Environmental Management Strategies Relating to Environmental Risk Assessment**

| Environmental Aspect: Drilling (Operation)               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                   |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------|
| Activities                                               | Cuttings and fluids in sumps and pits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |                   |
| Hazard                                                   | <b>Inappropriate storage of hazardous material</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                   |
| Inherent Risk Analysis and Ranking                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                   |
| Potential Environmental Impact                           | Consequence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Likelihood | Inherent Risk     |
| Contamination of soil, surface water and/or groundwater. | <b>3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>2</b>   | <b>6 (Medium)</b> |
| Fauna mortalities                                        | <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>3</b>   | <b>6 (Medium)</b> |
|                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                   |
| Mitigation Measures (Control to Reduce Likelihood)       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                   |
| Contamination of soil, surface water and/or groundwater. | <p>Water-based muds (WBM) will be used.</p> <p>Only DMP approved fluids and chemicals will be used.</p> <p>Liquid chemicals, drilling muds or hazardous substances will be stored in a bund capable of holding 110% of the stored volume.</p> <p>Cuttings from water-based drilling will be discharged in to a suitably lined receptacle located on the well site.</p> <p>Sump and pit levels will be monitored for overflow during and after high rainfall.</p> <p>Soil in sumps and pits will be tested for the presence of contaminants following completion of operations.</p> <p>Contaminated material will be removed and disposed of offsite at a licenced facility.</p> |            |                   |
| Fauna mortalities                                        | <p>Fencing between surrounding vegetation and sumps/pits will be installed (e.g. well site perimeter fencing).</p> <p>Sumps and pits will be provided with fauna egress points as recommended in DMP's guidance document Fauna Egress Matting and Ramps.</p> <p>Sumps and pits will be monitored regularly for presence of fauna.</p>                                                                                                                                                                                                                                                                                                                                           |            |                   |
| Residual Risk and Analysis and Ranking                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                   |
| Potential Environmental Impact                           | Consequence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Likelihood | Residual Risk     |
| Contamination of soil, surface water and/or groundwater. | <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>1</b>   | <b>2 (Low)</b>    |
| Fauna mortalities                                        | <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>2</b>   | <b>4 (Low)</b>    |

**Table 2b Environmental Management Strategies Relating to Environmental Risk Assessment**

| Environmental Aspect: Drilling (Operation)                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                          |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------|
| Activities                                                        | Well blow out                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                          |
| Hazard                                                            | <b>Inappropriate use of equipment</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                          |
| Inherent Risk Analysis and Ranking                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                          |
| Potential Environmental Impact                                    | Consequence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Likelihood | Inherent Risk            |
| <b>Well blowout</b>                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                          |
| Fire.<br>Contamination of soil, surface water and/or groundwater. | <b>5</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>5</b>   | <b>25 (Catastrophic)</b> |
| Mitigation Measures (Control to Reduce Likelihood)                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                          |
| <b>Well blowout</b>                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                          |
| Fire.<br>Contamination of soil, surface water and/or groundwater. | <p>Drilling will be conducted according to an approved drilling plan by qualified drilling contractors in accordance with industry best practice standards and procedures.</p> <p>The well head, pipework and containment vessels will be appropriately banded.</p> <p>Hydrostatic control of the well will be maintained at all times.</p> <p>The surface hole section of the well will be drilled using a diverter. Thereafter, a blowout preventer will be installed on the drilling rig during drilling.</p> <p>Only DMP approved fluids and chemicals will be used.</p> <p>Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills.</p> <p>A groundwater monitoring program will be implemented via neighbouring bores.</p> |            |                          |
| Residual Risk and Analysis and Ranking                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                          |
| Potential Environmental Impact                                    | Consequence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Likelihood | Residual Risk            |
| <b>Well blowout</b>                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                          |
| Fire.<br>Contamination of soil, surface water and/or groundwater. | <b>5</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>1</b>   | <b>5 (Low)</b>           |

**Table 2c Environmental Management Strategies Relating to Environmental Risk Assessment**

| Environmental Aspect: Drilling (Operation)               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                    |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
| Activities                                               | Release of drilling muds and hydrocarbons from well (unplanned)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                    |
| Hazard                                                   | <b>Contamination, fire and increased emissions</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |                    |
| Inherent Risk Analysis and Ranking                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                    |
| Potential Environmental Impact                           | Consequence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Likelihood | Inherent Risk      |
| Contamination of soil, surface water and/or groundwater. | <b>3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>2</b>   | <b>6 (Medium)</b>  |
| Fire.                                                    | <b>4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>3</b>   | <b>12 (Medium)</b> |
| Greenhouse gas emissions.                                | <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>2</b>   | <b>4 (Low)</b>     |
| Mitigation Measures (Control to Reduce Likelihood)       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                    |
| Contamination of soil, surface water and/or groundwater. | <p>Only DMP approved fluids and chemicals will be used.</p> <p>Soil in sumps and pits will be tested for the presence of contaminants following completion of operations.</p> <p>Contaminated material will be removed and disposed of offsite at a licenced facility.</p> <p>A series of control valves (Christmas tree) will be installed at the surface as secondary barriers preventing the unwanted egress of formation fluids. The primary barrier will remain wellbore fluid density.</p> <p>The well head, pipework and containment vessels will be appropriately banded.</p> <p>Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills.</p> <p>A groundwater monitoring program will be implemented via neighbouring bores.</p> |            |                    |
| Fire.                                                    | <p>Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills.</p> <p>A 20 m fire break will be maintained around the well site during project activities.</p> <p>Appropriate fire response equipment and vehicles will be maintained on-site at all times during operations.</p> <p>Firefighting equipment will be fitted to all machinery and equipment and all personnel will be appropriately trained in how to prevent and respond to fires.</p>                                                                                                                                                                                                                                                                                        |            |                    |
| Greenhouse gas emissions.                                | <p>Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |                    |
| Residual Risk and Analysis and Ranking                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                    |
| Potential Environmental Impact                           | Consequence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Likelihood | Residual Risk      |
| Contamination of soil, surface water and/or groundwater. | <b>3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>1</b>   | <b>3 (Low)</b>     |
| Fire.                                                    | <b>4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>2</b>   | <b>4 (Low)</b>     |
| Greenhouse gas emissions.                                | <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>1</b>   | <b>2 (Low)</b>     |

**Table 2d Environmental Management Strategies Relating to Environmental Risk Assessment**

| Environmental Aspect: Drilling (Operations)                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|
| Activities                                                                            | Vehicle and equipment/plant movement and use                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |               |
| Hazard                                                                                | Inappropriate or incorrect use of vehicle and equipment                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |               |
| Inherent Risk Analysis and Ranking                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |               |
| Potential Environmental Impact                                                        | Consequence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Likelihood | Inherent Risk |
| Introduction and spread of weeds and dieback.                                         | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3          | 9 (Medium)    |
| Loss of conservation significant flora                                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2          | 8 (Medium)    |
| Erosion of soil and generation of dust                                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3          | 6 (Medium)    |
| Fauna mortalities/ disturbance.                                                       | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3          | 6 (Medium)    |
| Contamination of soil (e.g. in refuelling, hydraulic line bursts, spilt drums, etc.). | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4          | 8 (Medium)    |
| Fire                                                                                  | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3          | 12 (Medium)   |
| Mitigation Measures (Control to Reduce Likelihood)                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |               |
| Introduction and spread of weeds and dieback.                                         | <p>The Vacant Crown Land in the project area will be treated as dieback-free.</p> <p>A dieback and weed management plan will be implemented.</p> <p>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.</p> <p>Adhere to any applicable biosecurity requirements of landowners as per land access agreements.</p> <p>All personnel will be instructed on weed/disease risks and correct hygiene procedures.</p> |            |               |
| Loss of conservation significant flora                                                | <p>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.</p> <p>All personnel will be instructed on conservation significant values and related responsibilities.</p>                                                                                                                                                                                                                                             |            |               |
| Erosion of soil and generation of dust.                                               | <p>Vehicle speeds will be restricted within the project area.</p> <p>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.</p> <p>Consider dust suppression techniques such as watering if required.</p> <p>Screening or sheeting material (e.g. crushed rock) will be spread over the well site and access road.</p>                                                                                             |            |               |
| Fauna mortalities/disturbance.                                                        | <p>Vehicle speeds will be restricted within the project area.</p> <p>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.</p> <p>All personnel will be instructed on conservation significant values and related responsibilities.</p> <p>All activities other than drilling will be conducted during daylight hours only.</p>                                                                                   |            |               |
| Contamination of soil (e.g. in refuelling, hydraulic line bursts, spilt drums, etc.). | <p>Use drip trays, spill mats or equivalent while refuelling.</p> <p>Refuel, service and maintain vehicles and machinery at designated</p>                                                                                                                                                                                                                                                                                                                                                   |            |               |

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | <p>locations only.</p> <p>Contaminated material will be removed and disposed of offsite at a licenced facility.</p> <p>Spill kits will be available during all refuelling operations.</p> <p>Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills.</p> <p>Implement bunding to capture spills where possible.</p>                                                                                                                                                                                                                                                                                                  |
| Fire | <p>Firefighting equipment will be fitted to all machinery and equipment and all personnel will be appropriately trained in how to prevent and respond to fires.</p> <p>Appropriate fire response equipment and vehicles will be maintained on-site at all times during operations.</p> <p>Permit smoking only in designated smoking areas.</p> <p>All vehicles and machinery will operate on diesel fuel.</p> <p>Adopt emergency response plan (ERP) and oil spill response plan (OSRP), including periodic drills.</p> <p>Vehicle and machinery movements will be restricted to the development footprint and existing disturbance, tracks and firebreaks.</p> |

#### Residual Risk and Analysis and Ranking

| Potential Environmental Impact                                                        | Consequence | Likelihood | Residual Risk     |
|---------------------------------------------------------------------------------------|-------------|------------|-------------------|
| Introduction and spread of weeds and dieback.                                         | <b>3</b>    | <b>1</b>   | <b>3 (Low)</b>    |
| Loss of conservation significant flora                                                | <b>4</b>    | <b>1</b>   | <b>4 (Low)</b>    |
| Erosion of soil and generation of dust                                                | <b>2</b>    | <b>1</b>   | <b>2 (Low)</b>    |
| Fauna mortalities/ disturbance.                                                       | <b>2</b>    | <b>2</b>   | <b>4 (Low)</b>    |
| Contamination of soil (e.g. in refuelling, hydraulic line bursts, spilt drums, etc.). | <b>2</b>    | <b>3</b>   | <b>6 (Medium)</b> |
| Fire                                                                                  | <b>4</b>    | <b>2</b>   | <b>8 (Medium)</b> |

**Table 3a Environmental Management Strategies Relating to Environmental Risk Assessment**

| Environmental Aspect: Operation of site facilities and accommodation (waste management) |                                                                                                                                                                                                                                                                                                        |            |                |
|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------|
| Activities                                                                              | Generation, storage and removal of wastes                                                                                                                                                                                                                                                              |            |                |
| Hazard                                                                                  | <b>Inappropriate storage and removal of waste</b>                                                                                                                                                                                                                                                      |            |                |
| Inherent Risk Analysis and Ranking                                                      |                                                                                                                                                                                                                                                                                                        |            |                |
| Potential Environmental Impact                                                          | Consequence                                                                                                                                                                                                                                                                                            | Likelihood | Inherent Risk  |
| Attraction of fauna to waste receptacles and Rubbish from project left on site.         | 1                                                                                                                                                                                                                                                                                                      | 4          | <b>4 (Low)</b> |
| Contamination of soil or groundwater (e.g. spills from sewage systems.)."               | 1                                                                                                                                                                                                                                                                                                      | 4          | <b>4 (Low)</b> |
| Mitigation Measures (Control to Reduce Likelihood)                                      |                                                                                                                                                                                                                                                                                                        |            |                |
| Attraction of fauna to waste receptacles.<br>Rubbish from project left on site.         | All putrescible waste will be stored in bins that have a tightly secured lid to avoid fauna attraction and entry.<br>Fencing between surrounding vegetation and sumps/pits will be installed (e.g. well site perimeter fencing).                                                                       |            |                |
| Contamination of soil or groundwater (e.g. spills from sewage systems.).                | Refuel, service and maintain vehicles and machinery at designated locations only.<br>Contaminated material will be removed and disposed of offsite at a licenced facility.<br>Sewage and any other controlled waste will be contained and removed and disposed of offsite using a licenced contractor. |            |                |
| Residual Risk and Analysis and Ranking                                                  |                                                                                                                                                                                                                                                                                                        |            |                |
| Potential Environmental Impact                                                          | Consequence                                                                                                                                                                                                                                                                                            | Likelihood | Residual Risk  |
| Attraction of fauna to waste receptacles and Rubbish from project left on site.         | 1                                                                                                                                                                                                                                                                                                      | 2          | <b>2 (Low)</b> |
| Contamination of soil or groundwater (e.g. spills from sewage systems.).                | 1                                                                                                                                                                                                                                                                                                      | 2          | <b>2 (Low)</b> |

**Table 3b Environmental Management Strategies Relating to Environmental Risk Assessment**

| Environmental Aspect: Operation of site facilities and accommodation |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                   |
|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------|
| Activities                                                           | Storage of chemicals, hazardous materials and dangerous goods                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                   |
| Hazard                                                               | <b>Inappropriate storage</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                   |
| Inherent Risk Analysis and Ranking                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                   |
| Potential Environmental Impact                                       | Consequence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Likelihood | Inherent Risk     |
| Fire                                                                 | <b>4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>2</b>   | <b>8 (Medium)</b> |
| Contamination of soil, surface water and/or groundwater              | <b>4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>2</b>   | <b>8 (Medium)</b> |
| Mitigation Measures (Control to Reduce Likelihood)                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                   |
| Fire                                                                 | <p>Permit smoking only in designated smoking areas.</p> <p>Firefighting equipment will be fitted to all machinery and equipment and all personnel will be appropriately trained in how to prevent and respond to fires.</p> <p>Appropriate fire response equipment and vehicles will be maintained on-site at all times during operations.</p> <p>The emergency response plan (ERP) and oil spill response plan (OSRP) will be tested periodically.</p> <p>A 20 m fire break will be maintained around the well site during project activities.</p> |            |                   |
| Contamination of soil, surface water and/or groundwater              | <p>Liquid chemicals, drilling muds or hazardous substances will be stored in a bund capable of holding 110% of the stored volume.</p> <p>Dangerous goods will be stored in accordance with applicable legislation.</p> <p>Dangerous goods will be stored and managed by licensed contractors.</p> <p>Spill kits will be available in areas where dangerous goods and hazardous materials are stored.</p> <p>Contaminated material will be removed and disposed of offsite at a licenced facility.</p>                                               |            |                   |
| Residual Risk and Analysis and Ranking                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                   |
| Potential Environmental Impact                                       | Consequence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Likelihood | Residual Risk     |
| Fire                                                                 | <b>4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>1</b>   | <b>4 (Low)</b>    |
| Contamination of soil, surface water and/or groundwater              | <b>4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>1</b>   | <b>4 (Low)</b>    |

**Table 3c Environmental Management Strategies Relating to Environmental Risk Assessment**

| Environmental Aspect: Operation of site facilities and accommodation |                                                                                             |            |               |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------|---------------|
| Activities                                                           | Facility lighting and noise                                                                 |            |               |
| Hazard                                                               | <b>Unacceptable noise and light emissions</b>                                               |            |               |
| Inherent Risk Analysis and Ranking                                   |                                                                                             |            |               |
| Potential Environmental Impact                                       | Consequence                                                                                 | Likelihood | Inherent Risk |
| <b>Facility lighting</b>                                             |                                                                                             |            |               |
| Disturbance to fauna                                                 | 1                                                                                           | 4          | 4 (Low)       |
| <b>Noise</b>                                                         |                                                                                             |            |               |
| Disturbance to fauna and surrounding landholders                     | 1                                                                                           | 2          | 2 (Low)       |
| Mitigation Measures (Control to Reduce Likelihood)                   |                                                                                             |            |               |
| <b>Facility lighting</b>                                             |                                                                                             |            |               |
| Disturbance to fauna                                                 | Set up facility lighting to minimise light spill into adjacent areas.                       |            |               |
| <b>Noise</b>                                                         |                                                                                             |            |               |
| Disturbance to fauna and surrounding landholders                     | Ensure vehicles and machinery have standard emission control devices fitted and maintained. |            |               |
| Residual Risk and Analysis and Ranking                               |                                                                                             |            |               |
| Potential Environmental Impact                                       | Consequence                                                                                 | Likelihood | Residual Risk |
| <b>Facility lighting</b>                                             |                                                                                             |            |               |
| Disturbance to fauna                                                 | 1                                                                                           | 3          | (Low)         |
| <b>Noise</b>                                                         |                                                                                             |            |               |
| Disturbance to fauna and surrounding landholders                     | 1                                                                                           | 2          | (Low)         |

**Table 4a Environmental Management Strategies Relating to Environmental Risk Assessment**

| Environmental Aspect: Well suspension                                                                 |                                                                                                                                                                                                |            |               |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|
| Activities                                                                                            | Third party access and loss of well control                                                                                                                                                    |            |               |
| Hazard                                                                                                | <b>Inappropriate access and contamination of soil/water</b>                                                                                                                                    |            |               |
| Inherent Risk Analysis and Ranking                                                                    |                                                                                                                                                                                                |            |               |
| Potential Environmental Impact                                                                        | Consequence                                                                                                                                                                                    | Likelihood | Inherent Risk |
| <b>Third party access</b>                                                                             |                                                                                                                                                                                                |            |               |
| Damage to well infrastructure                                                                         | 5                                                                                                                                                                                              | 2          | 10 (Medium)   |
| Fire                                                                                                  | 5                                                                                                                                                                                              | 2          | 10 (Medium)   |
| Contamination of soil. Surface water and/or groundwater                                               | 5                                                                                                                                                                                              | 2          | 10 (Medium)   |
| <b>Loss of well control</b>                                                                           |                                                                                                                                                                                                |            |               |
| Fire                                                                                                  | 5                                                                                                                                                                                              | 2          | 10 (Medium)   |
| Contamination of soil. Surface water and/or groundwater                                               | 5                                                                                                                                                                                              | 2          | 10 (Medium)   |
| Mitigation Measures (Control to Reduce Likelihood)                                                    |                                                                                                                                                                                                |            |               |
| <b>Third Party Access</b>                                                                             |                                                                                                                                                                                                |            |               |
| Damage to well infrastructure.<br>Fire.<br>Contamination of soil.<br>Surface water and/or groundwater | Fence will be retained during well suspension to prevent third party access.<br>The well site will be inspected regularly during well suspension using physical and remote monitoring methods. |            |               |
|                                                                                                       | A 20 m fire break will be maintained around the well site.                                                                                                                                     |            |               |
|                                                                                                       | A groundwater monitoring program will be implemented via neighbouring bores.                                                                                                                   |            |               |
|                                                                                                       | All vehicles, equipment, plant and materials will be removed from the well site during well suspension.                                                                                        |            |               |
| <b>Loss of well control</b>                                                                           |                                                                                                                                                                                                |            |               |
| Fire                                                                                                  | Well will be suspended in accordance with relevant regulations.<br>A 20 m fire break will be maintained around the well site.                                                                  |            |               |
| Contamination of soil. Surface water and/or groundwater                                               | A groundwater monitoring program will be implemented via neighbouring bores<br>The well site will be inspected regularly during well suspension using physical and remote monitoring methods.  |            |               |
| Residual Risk and Analysis and Ranking                                                                |                                                                                                                                                                                                |            |               |
| Potential Environmental Impact                                                                        | Consequence                                                                                                                                                                                    | Likelihood | Residual Risk |
| <b>Third Party Access</b>                                                                             |                                                                                                                                                                                                |            |               |
| Damage to well infrastructure                                                                         | 1                                                                                                                                                                                              | 3          | 3 (Low)       |
| Fire                                                                                                  | 1                                                                                                                                                                                              | 3          | 3 (Low)       |

|                                                         |   |   |         |
|---------------------------------------------------------|---|---|---------|
| Contamination of soil. Surface water and/or groundwater | 1 | 3 | 3 (Low) |
| <b>Loss of well control</b>                             |   |   |         |
| Fire                                                    | 5 | 1 | 5 (Low) |
| Contamination of soil, surface water and/or groundwater | 5 | 1 | 5 (Low) |

**Table 5a Environmental Management Strategies Relating to Environmental Risk Assessment**

| Environmental Aspect: Rehabilitation                  |                                                                                                                                                                      |            |                |
|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------|
| Activities                                            | Rehabilitation not carried out in a timely manner                                                                                                                    |            |                |
| Hazard                                                | <b>Native vegetation does not establish</b>                                                                                                                          |            |                |
| Inherent Risk Analysis and Ranking                    |                                                                                                                                                                      |            |                |
| Potential Environmental Impact                        | Consequence                                                                                                                                                          | Likelihood | Inherent Risk  |
| Vegetation in disturbance footprint not rehabilitated | <b>2</b>                                                                                                                                                             | <b>2</b>   | <b>4 (Low)</b> |
| Mitigation Measures (Control to Reduce Likelihood)    |                                                                                                                                                                      |            |                |
| Vegetation in disturbance footprint not rehabilitated | A rehabilitation management plan will be implemented.<br>Rehabilitation of the well site will commence as soon as practicable (assuming well is no longer required). |            |                |
| Residual Risk and Analysis and Ranking                |                                                                                                                                                                      |            |                |
| Potential Environmental Impact                        | Consequence                                                                                                                                                          | Likelihood | Residual Risk  |
| Vegetation in disturbance footprint not rehabilitated | <b>2</b>                                                                                                                                                             | <b>1</b>   | <b>2 (Low)</b> |

**Table 6a Environmental Management Strategies Relating to Environmental Risk Assessment**

| Environmental Aspect: Stakeholder management                                                                                                    |                                                                                                                                                                                                                                                 |            |                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
| Activities                                                                                                                                      | Unauthorised access to properties and presence of project team                                                                                                                                                                                  |            |                    |
| Hazard                                                                                                                                          | <b>Inappropriate behaviour of project team</b>                                                                                                                                                                                                  |            |                    |
| Inherent Risk Analysis and Ranking                                                                                                              |                                                                                                                                                                                                                                                 |            |                    |
| Potential Environmental Impact                                                                                                                  | Consequence                                                                                                                                                                                                                                     | Likelihood | Inherent Risk      |
| <b>Unauthorised access to properties</b>                                                                                                        |                                                                                                                                                                                                                                                 |            |                    |
| Unauthorised access by project personnel,<br>Breach of landowner's agreement.<br>Damage to landowners infrastructure                            | <b>3</b>                                                                                                                                                                                                                                        | <b>3</b>   | <b>9 (Medium)</b>  |
| <b>Presence of project team</b>                                                                                                                 |                                                                                                                                                                                                                                                 |            |                    |
| Disruption to landowners.                                                                                                                       | <b>2</b>                                                                                                                                                                                                                                        | <b>5</b>   | <b>10 (Medium)</b> |
| Additional vehicles on local roads.<br>Disruption to traffic.<br>Disruption to local residents.                                                 | <b>3</b>                                                                                                                                                                                                                                        | <b>4</b>   | <b>12 (Medium)</b> |
| <b>Failure to engage stakeholders</b>                                                                                                           |                                                                                                                                                                                                                                                 |            |                    |
| Negative community sentiment resulting in complaints about the project or future difficulties in obtaining social licence for similar projects. | <b>3</b>                                                                                                                                                                                                                                        | <b>3</b>   | <b>9 (Medium)</b>  |
| Mitigation Measures (Control to Reduce Likelihood)                                                                                              |                                                                                                                                                                                                                                                 |            |                    |
| <b>Unauthorised access to properties</b>                                                                                                        |                                                                                                                                                                                                                                                 |            |                    |
| Unauthorised access by project personnel,<br>Breach of landowner's agreement.<br>Damage to landowners infrastructure                            | Ensure any applicable landowner access agreements are in place before project commences.<br>All personnel will be instructed on landowner and stakeholder sensitivities and related responsibilities.<br>Adhere to stakeholder management plan. |            |                    |
| <b>Presence of project team</b>                                                                                                                 |                                                                                                                                                                                                                                                 |            |                    |
| Disruption to landowners.                                                                                                                       | Ensure any applicable landowner access agreements are in place before project commences.<br>All personnel will be instructed on landowner and stakeholder sensitivities and related responsibilities.<br>Adhere to stakeholder management plan. |            |                    |
| Additional vehicles on local roads.<br>Disruption to traffic.<br>Disruption to local residents.                                                 | Implement a traffic management plan (approved by local shire) where required.<br>Adhere to stakeholder management plan.                                                                                                                         |            |                    |
| <b>Failure to engage stakeholders</b>                                                                                                           |                                                                                                                                                                                                                                                 |            |                    |
| Negative community sentiment resulting in complaints about the project or future difficulties in obtaining social licence for similar           | Adhere to stakeholder management plan.<br>All personnel will be instructed on landowner and stakeholder                                                                                                                                         |            |                    |

|                                                                                                                                                          |                                             |                   |                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------|----------------------|
| projects.                                                                                                                                                | sensitivities and related responsibilities. |                   |                      |
| <b>Residual Risk and Analysis and Ranking</b>                                                                                                            |                                             |                   |                      |
| <b>Potential Environmental Impact</b>                                                                                                                    | <b>Consequence</b>                          | <b>Likelihood</b> | <b>Residual Risk</b> |
| <b>Unauthorised access to properties</b>                                                                                                                 |                                             |                   |                      |
| Unauthorised access by project personnel,<br>Breach of landowner's agreement.<br>Damage to landowners infrastructure                                     | <b>3</b>                                    | <b>1</b>          | <b>3 (Low)</b>       |
| <b>Presence of project team</b>                                                                                                                          |                                             |                   |                      |
| Disruption to landowners.                                                                                                                                | <b>1</b>                                    | <b>3</b>          | <b>3 (Low)</b>       |
| Additional vehicles on local roads.<br>Disruption to traffic.<br>Disruption to local residents.                                                          | <b>1</b>                                    | <b>3</b>          | <b>3 (Low)</b>       |
| <b>Failure to engage stakeholders</b>                                                                                                                    |                                             |                   |                      |
| Negative community sentiment resulting in<br>complaints about the project or future<br>difficulties in obtaining social licence for similar<br>projects. | <b>2</b>                                    | <b>2</b>          | <b>4 (Low)</b>       |

## Warrego Energy Pty Ltd

### West Erregulla – 2 Chemical Disclosure



## A. System Details

### West Erregulla – 2 Drilling

Total volume of system 542m<sup>3</sup>

### A. Product List

| Product Name           | Purpose                                                                                        |
|------------------------|------------------------------------------------------------------------------------------------|
| Barite                 | Weighting agent                                                                                |
| Bentonite              | Viscosifier                                                                                    |
| Calcium Carbonate      | Fluid loss                                                                                     |
| Caustic soda           | pH control – prevents bacteria/corrosion                                                       |
| Citric Acid            | pH buffer                                                                                      |
| Citric Acid            | pH Buffer                                                                                      |
| Disodium Pyrophosphate | Deflocculant or dispersant for Bentonite muds or fluids with high levels of low gravity solids |
| Freshwater             | Base fluid                                                                                     |
| Glutaraldehyde         | Biocide                                                                                        |
| Limestone LS           | Bridging and weighting agent                                                                   |
| MEG                    | May be used to free stuck pipe                                                                 |
| Potassium Chloride     | Shale swell inhibition                                                                         |
| Potassium Chloride     | shale swell inhibition                                                                         |
| Salt/Sodium Chloride   | Weighting agent                                                                                |
| Soda Ash               | pH/hardness control                                                                            |
| Sodium Bicarbonate     | pH buffer, contamination treatment                                                             |
| Sodium Montmorillonite | Clay mud additive/viscosifier                                                                  |
| Sodium Sulphite        | Oxygen scavenger                                                                               |
| Starch                 | Lost circulation material                                                                      |
| Xanthan Gum            | Viscosifier                                                                                    |

## B. Chemicals List

| <b>Chemicals</b>                      | <b>CAS Number</b> |
|---------------------------------------|-------------------|
| 2-Propenenitrile                      | 9003-18-3         |
| Acrylamide, Sodium Acrylate Copolymer | 25987-30-8        |
| Barium Sulphate                       | 7727-43-7         |
| Bentonite                             | 1302-78-9         |
| Calcium Carbonate                     | 471-34-1          |
| Calcium Hydroxide                     | 1305-62-0         |
| Calcium Oxide                         | 1305-78-8         |
| Cellulose                             | 9004-34-6         |
| Citric Acid                           | 77-92-9           |
| Cristobalite                          | 14464-46-1        |
| Diatomaceous Earth                    | 68855-54-9        |
| Disodium Pyrophosphate                | 7758-16-9         |
| Ethylene Glycol                       | 107-21-1          |
| Fuller's Earth                        | 8031-18-3         |
| Glutaraldehyde                        | 111-30-8          |
| Hexanedinitrile                       | 628-73-9          |
| Hydrochloric Acid                     | 7647-01-0         |
| Magnesium Oxide                       | 1309-48-4         |
| Paraformaldehyde                      | 30525 894         |
| Polyethylene                          | 9002-88-4         |
| Polyisoprene                          | 9003-31-0         |
| Potassium Chloride                    | 7447-40-7         |
| Quartz (Silica Crystalline)           | 14808-60-7        |
| Rubber                                | 9006-04-6         |
| Sodium Bicarbonate                    | 144-55-8          |
| Sodium Carbonate                      | 497-19-8          |
| Sodium Carboxymethyl Cellulose        | 9004-32-4         |
| Sodium Chloride                       | 7647-14-5         |
| Sodium Glycolate                      | 2836-32-0         |
| Sodium Hydroxide                      | 1310-73-2         |
| Sodium Montmorillonite                | 1318-93-0         |
| Sodium Sulphite                       | 7757-83-7         |
| Starch                                | 9005 25 8         |
| Water                                 | 7732-18-5         |
| Xanthan Gum                           | 11138-66-2        |

## B. System Details

### West Erregulla – 2 Cementing

Total volume of system 110m<sup>3</sup> (includes 20% open hole excess)

#### A. Product List

| Product Name       | Purpose                 |
|--------------------|-------------------------|
| Water              | Base fluid              |
| Barite             | Weighting agent         |
| Sodium Silicate    | Slurry weight reduction |
| Tributyl Phosphate | Inhibition              |
| Xanthan            | Gelling agent           |

#### A. Chemicals List

| Chemicals                                     | CAS Number |
|-----------------------------------------------|------------|
| 2- Acrylamido-2-methyl-1-propanesulfonic acid | 15214-89-8 |
| Acrylamide                                    | 79-06-1    |
| Acrylomorpholine                              | 1175324    |
| Barite                                        | 13462-86-7 |
| Calcium Lignosulfonate                        | 8061-52-7  |
| Cement                                        | 65997-15-1 |
| Colloidal Silica                              | 7631-86-9  |
| Distillates (petroleum), hydrotreated light   | 64742-47-8 |
| Ethoxylated Tridecyl Alcohol                  | 24938-91-8 |
| Lime                                          | 1305-62-0  |
| N,N-Dimethylacrylamide                        | 284957     |
| Organoclay                                    | 68953-58-2 |
| Polyisobutylene                               | 9003-27-4  |
| Polypropylene Glycol                          | 25322-69-4 |
| Potassium Humate                              | 68514-28-3 |
| Silica Flour                                  | 14808-60-7 |
| Sodium Acid Pyrophosphate                     | 7758-16-9  |
| Sodium Oxide                                  | 1313-59-3  |

|                                                               |            |
|---------------------------------------------------------------|------------|
| Sodium salt of sulphonated naphthaleneformaldehyde condensate | 2624059    |
| Sodium Silicate                                               | 1344-09-8  |
| Tributyl Phosphate                                            | 126-73-8   |
| Water                                                         | 7732-18-5  |
| Xanthan                                                       | 11138-66-2 |

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