

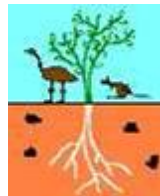
ENVIRONMENT MANAGEMENT PLAN

MEREENIE OIL AND GAS FIELD Maintenance Upgrades, Central Treatment Plant

Report prepared for Central Petroleum Limited

September 2018

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DOCUMENT CONTROL


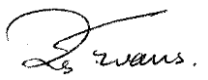
DISCLAIMER

This document has been prepared by Low Ecological Services (LES) for Central Petroleum Limited (CTP) in accordance with an agreement with CTP. LES has prepared this document using the skill and care expected from professional scientists to provide factual and technical information and reasonable solutions to identified risks. It does not constitute legal advice.

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PREFACE

All information on proposed operations contained in this document has been supplied by Central Petroleum Limited.

GLOSSARY	
AAPA	Aboriginal Areas Protection Authority
ALARP	As Low As Reasonably Practicable
APPEA	Australian Petroleum Production and Exploration Association
API	American Petroleum Institute
ASC	Australian Soils Classification
ASX	Australian Securities Exchanges
bgl	Below ground level
CLC	Central Land Council
CTP	Central Petroleum Limited
CTPL	Central Treatment Plant
DPIR	Department of Primary Industry and Resources
EPBC	Environmental Protection and Biodiversity Conservation
EMP	Environmental Management Plan
EcSD	Ecologically Sustainable Development
FEMP	Field Environment Management Plan
HS&E	Health, Safety and the Environment
km	Kilometres
KW	Kilowatts
L	Litres
LES	Low Ecological Services
m	Metres
Mi	Migration (EPBC listed)
Ma	Marine (EPBC listed)
mm	millimetres
MRN	Mereenie Gas and Oil Field
NT	Northern Territory
Nt	Near threatened
OL	Operating Licence
PMSR	Protected Matters Search Report
PMST	Protected Matters Search Tool
SoBS	Sites of Botanical Significance
SoCS	Sites of Conservation Significance
TPWC	Territory Parks and Wildlife Conservation

1 EXECUTIVE SUMMARY

This Environmental Management Plan (EMP) has been developed by Low Ecological Services (LES) on behalf of Central Petroleum Limited (CTP) for the Central Treatment Plant (CTPL) maintenance and upgrade work (Works) being carried out at the at Mereenie Oil and Gas Field (MRN).

Any identified risks or operational activities have been first referred to the existing approved MRN Field Environmental Management Plan (FEMP) to determine if the activity and risk is adequately covered by the approved FEMP or if alternative controls are required.

The Works consist of four components:

1. Upgrading PLC (programmable logic controller) through replacement
2. Restaging of the two existing field boost compressors
3. Restarting of Plant 3
4. Addition of larger separators to replace two small separators at the inlet of the plant and addition of a new field boost compressor

Pertinent points include:

- The existing approved MRN FEMP covers the safe operation of the CTPL and does not contain any limiting conditions around what is encompassed (activity wise) in this plant.
- All works will be conducted within the existing operational footprint of the CTPL and workshops as approved operational areas in the existing approved MRN FEMP.
- There is no clearing works or development of new roads required for these works. All travel will be on existing roads and access tracks in accordance with the travel policy standards as detailed in the approved MRN FEMP
- All staff will be accommodated within the existing camp accommodation facilities at MRN. The existing accommodation facilities are designed to hold up to 80 personnel, which will vary from time to time in accordance with measures as in the approved MRN FEMP. It is anticipated that to complete the works there may be a requirement to accommodate up to 100 personnel at any one time over a two-month period. The extra staff will be housed within the existing camp infrastructure through bunk beds.
- Existing laydown areas and storage space will be utilised within the workshop area and within the CTPL fenced area during construction in accordance with operational areas footprint as in the approved MRN FEMP
- Waste and water management is in accordance with the procedures as detailed in the approved MRN FEMP.
- All staff and contractors will be inducted into the requirements of the approved MRN FEMP.
- Traffic will be managed in accordance with measures as outlined in the approved MRN FEMP.
- Any hazardous chemicals or goods will be managed in accordance with procedures as the detailed in the approved MRN FEMP.

LES has assessed all four components and deem any environmental risks by the first three components to be covered by the existing approved MRN FEMP required for normal maintenance and safe operation of the existing CTPL infrastructure; Section 1.5 and 6.5.9 of the MRN FEMP.

The fourth component, which involves installation of footing posts for the new compressor and two separators, is not explicitly covered by the approved MRN FEMP and involves regulated works under the *Petroleum Act*. However, the existing controls of the approved MRN FEMP will ensure the residual environmental risk of this activity is very low.

It should also be noted that:

- The approved MRN FEMP does not contain any conditions which would limit the planned Works at the CTPL.
- The specific exclusions do not exclude any of the Works being done.

1. Upgrading of the PLC

This involves replacing the existing process PLCs (programmable logic controller) within the approved CTPL control room with a new PLC, and the required electrical work to connect it.

All staff required for this activity will be housed within the MRN camp with appropriate environmental management as per Section 6.5.11 of the approved MRN FEMP. Any waste will be managed in accordance with Section 6.5.12 of the approved MRN FEMP. All traffic will be on existing roads and tracks, with traffic management as per Section 6.5.1 of the approved MRN FEMP. Any hazardous material or chemicals required will be managed in accordance with Section 7.6 and Section 8 of the approved MRN FEMP.

2. Re-staging of the two field boost compressors

This includes maintenance and replacement work on the existing two compressors to ensure safe and efficient operation. This will require replacing of several pieces of pipework no longer suitable to operate and additional “bottles” or small vessels.

All staff required for this activity will be housed within the MRN camp with appropriate environmental management as per Section 6.5.11 of the approved MRN FEMP. Any waste will be managed in accordance with Section 6.5.12 of the approved MRN FEMP. All traffic will be on existing roads and tracks, with traffic management as per Section 6.5.1 of the approved MRN FEMP. Any hazardous material or chemicals required will be managed in accordance with Section 7.6 and Section 8 of the approved MRN FEMP.

3. Restarting of Plant 3

These works require maintenance and replacement of the pipework, electrical and instrumentation cabling, equipment and instrumentation which will involve removal and replace where required. Otherwise it will entail in situ sandblasting using GMA SpeedBlast™ Garnet, in a fully encapsulated tent to recycle the garnet. The compressors will be re-furbished off site and re-installed. Pipework that contains any paint that tests positive for lead will not be sand blasted, but will be replaced.

Any maintenance works regarding this item will be conducted within the workshop area as detailed in the approved MRN FEMP. There will be minimal on-site hydrostatic testing as all pipework has been tested off site before mobilisation to MRN. Any hydro-testing completed will be with water sourced from the MRN bores (Section 6.5.2) and waste water disposed of in the existing evaporation ponds in accordance with waste water management as outlined in the approved MRN FEMP (see Section 8.2.3 and 8.2.4). The volumes expected are small but will be recorded if over 2,000 L and any waste water

added to the evaporation ponds will be limited to maintaining an operational freeboard of 1.5 m in accordance with the approved MRN FEMP (Section 6.5.9).

All staff required for this activity will be housed within the MRN camp with appropriate environmental management as per Section 6.5.11 of the approved MRN FEMP. Any waste will be managed in accordance with Section 6.5.12 of the approved MRN FEMP. All traffic will be on existing roads and tracks, with traffic management as per Section 6.5.1 of the approved MRN FEMP. Any hazardous material or chemicals required will be managed in accordance with Section 7.6 and Section 8 of the approved MRN FEMP.

4. Replacement of two separators and installation of one field boost compressor

The fourth component requires ground disturbance and construction of infrastructure not explicitly covered by the approved MRN FEMP and is deemed a regulated activity under the *Petroleum Act*, specifically:

- Insertion of approximately 124 piles at a depth range from 5-7m, with a diameter of 100-325mm each
- The first 2m will be hand augured to avoid any potential impact to existing infrastructure.
- Transport of infrastructure to site
- Radioactive testing of infrastructure once established.

This will require extra equipment brought to site not explicitly covered under the existing approved MRN FEMP as listed below. It is worth noting that all of this equipment (except the piling rig) would be utilised as part of normal maintenance activities, for example, during major shutdowns or pipeline integrity testing (Section 6.5.8, 6.5.3 and 6.5.5.1).

- 1x55t Franna crane
- 1x250t Franna crane
- 1xDFI RGZ130 pile rig
- Radioactive source for NDT

The separators and compressor will be brought to site as completed units. The separators are currently stored in the workshop area at MRN. The compressor will be landed in Brisbane and will be transported to site via road.

New pipework, instrumentation and electrical cabling will be assembled once equipment items are in place. Pipework spools are prefabricated off site, minimising and preferably negating any hot work. There will be minimal on-site hydrostatic testing as all pipework has been tested off site before mobilisation to MRN. Any hydro-testing completed will be with water sourced from the MRN bores (Section 6.5.2 approved MRN FEMP) and waste water disposed of in the existing evaporation ponds in accordance with waste water management as outlined in the approved MRN FEMP (Section 8.2.4 and 8.2.3). The volumes expected are small but will be recorded if over 2,000 L and any waste water added to the evaporation ponds will be limited to maintaining an operational freeboard of 1.5 m in accordance with the approved MRN FEMP (Section 6.5.9).

All staff required for this activity will be housed within the MRN camp and appropriate environmental management as per Section 6.5.11 of the approved MRN FEMP. Any waste will be managed in accordance with Section 6.5.12 of the approved MRN FEMP. All traffic will be on existing roads and

tracks, with traffic management as per Section 6.5.1 of the approved MRN FEMP. Any hazardous material or chemicals required will be managed in accordance with Section 7.6 and Section 8 of the approved MRN FEMP.

In this situation where low level site activities are proposed that are not explicitly covered in the approved MRN FEMP, a reasonable approach is to test whether the existing approved FEMP provides adequate controls to ensure risk is managed to a level that is as low as reasonably practicable. Hence, LES have reviewed the risks involved with this component of the Works and are satisfied that existing environmental mitigation and preventative measures within the approved MRN FEMP adequately minimise these risks to as low as reasonably practicable. This EMP has been developed to provide a bridging document to the existing approved MRN FEMP for maintenance activities and provide management controls for any regulated activity that is not covered by the approved MRN FEMP as part of these works.

Any increase to environmental risk from component four is minimal due to all works being conducted within an existing disturbed, cleared and maintained fenced operational area as detailed in the approved MRN FEMP Section 6.5.9. All mitigation measures required to further reduce the remaining environmental risks are applicable from existing measures detailed in the approved MRN FEMP, specifically the relevant Sections of the approved MRN FEMP include:

- Hazardous goods and chemical management, handling and storage – Section 6.5 and Section 8
- Traffic, roads and erosion – Section 8.2.2, 7.6.2, 6.5.1 & Appendix 7
- Camp facilities – 6.5.11
- Operation of the CTPL – Section 6.5.9
- Waste management – Section 8.2.4
- Water management – Section 8.2.3
- Flora management – Section 8.2.1
- Fauna management - Section 8.2.1
- Air quality management – Section 8.2.5
- Fire management – Section 8.2.6
- Stakeholder consultation – Section 12

The existing environment has been extensively surveyed and described by LES for both this EMP and the approved MRN FEMP (Section 5) and extensive previous surveys and development of the MRN beginning in 1964. The area in which the Works will be undertaken is within already cleared, fenced and disturbed areas that are maintained for operational purposes as detailed in the approved MRN FEMP (Section 6.5.9). There is no clearing works or development of new roads required for these works. All travel will be on existing roads and access tracks as detailed in the approved MRN FEMP (Section 6.5.1). All staff will be accommodated within the existing camp facilities at MRN in accordance with the procedures in the approved MRN FEMP (Section 6.5.11). Existing laydown areas and storage space will be utilised within the workshop area, a laydown area will be utilised within the CTPL fenced area during construction (Section 6.5.9 approved MRN FEMP).

The EMP incorporates Ecologically Sustainable Design (EcSD) and reducing risks to As Low As Reasonably Possible (ALARP). EcSD principles ensure all works are conducted in a manner that does not impact the future amenity of the environment for either CTP or surrounding stakeholders.

Reducing risks to ALARP requires implementing current industry best practise principles and guidelines to mitigate the identified environmental risks. Where applicable mitigation measures have been referred to the over-arching approved MRN FEMP where existing audited measures adequately reduce the risk to ALARP.

The environmental outcomes of the rehabilitation plan are in accordance with the approved MRN FEMP (Section 11):

- All waste removed from the site;
- Final landform to be reinstated to match surrounding environment;
- Removed top soil and spoil respread over all cleared areas to maintain existing level of disturbance;
- Ensure no new weeds are present.

The affected stakeholders for this operation are those outlined in the approved MRN FEMP (Section 12) including the Haasts Bluff Aboriginal Land Trust, Central Land Council and Department of Primary Industry and Resources due to increased traffic in transport of staff and materials to site.

CTP will follow the current and ongoing consultation process as outlined in the approved MRN FEMP, Section 12.

Key contact details for the project are:

Company Name	Central Petroleum Limited
ACN/ABN	ABN: 95 081 592 734
Street Address	Level 7/369 Ann Street
Postal Address	PO Box 292 Brisbane, Qld 4000
Telephone	+61 (0)7 3181 3800
Facsimile	+61 (0)7 3181 3855
Key Contact	Ben Visser – General Manager Operations
Email	benvisser@centralpetroleum.com.au
Website	www.centralpetroleum.com.au

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3 INTRODUCTION

3.1 Project Outline

Central Petroleum Limited (CTP) as 50% owner and operator of Mereenie Oil and Gas Field (MRN) will be carrying out maintenance and upgrade works (Works) of the Central Treatment Plant (CTPL). Most of the Works are covered by the approved Field Environmental Management Plan (FEMP) under maintenance and operation of the MRN facilities.

The Works consist of four components:

- Upgrading PLC (programmable logic controller) through replacement
- Restaging of the two existing field boost compressors
- Restarting of Plant 3
- Addition of larger separators

This EMP provides an analysis of all potential environmental impacts and associated mitigation measures, monitoring requirements and environmental objectives for the Works on the CTPL and references existing measures in the approved MRN FEMP where appropriate.

3.2 Location

The CTPL is within MRN which is in the Amadeus Basin, approximately 280km west of Alice Springs (by road) in the Northern Territory (NT).

Access to the MRN from Alice Springs is via a network of sealed and unsealed public and private roads, heading west from Alice Springs along Larapinta Drive/Red Centre Way to Hermannsburg, and then continuing towards Kings Canyon. The turn off to the MRN is left off the Red Centre Way; approximately 175km past Hermannsburg.

Figure 3-1 shows the location of MRN in relation to Alice Springs and other nearby communities and Figure 3-2 shows the location of the CTPL at MRN in Operating License 5 (OL5).

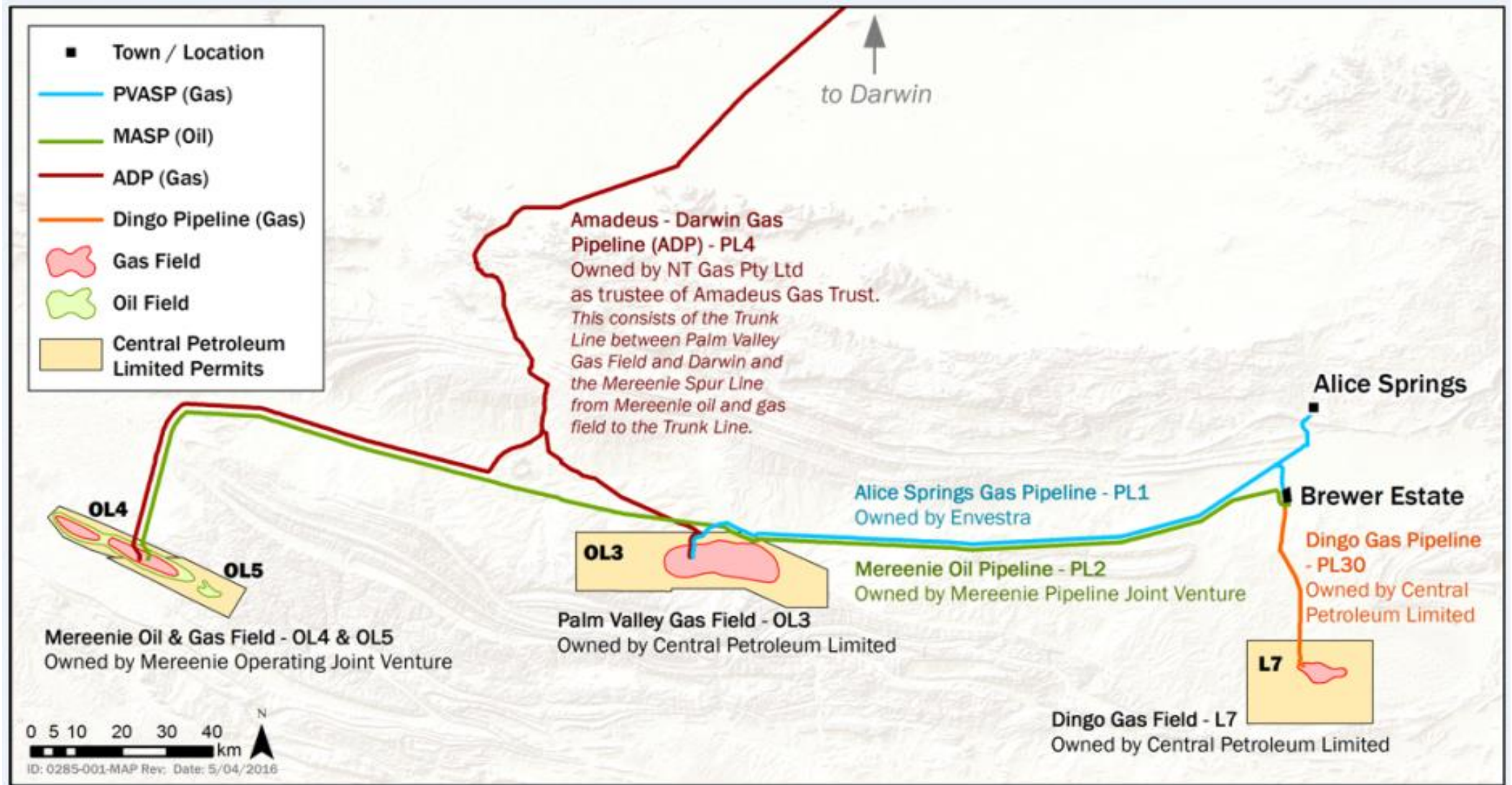


Figure 3-1. Location of the MRN in relation to Alice Springs and CTP's other petroleum developments in the area.

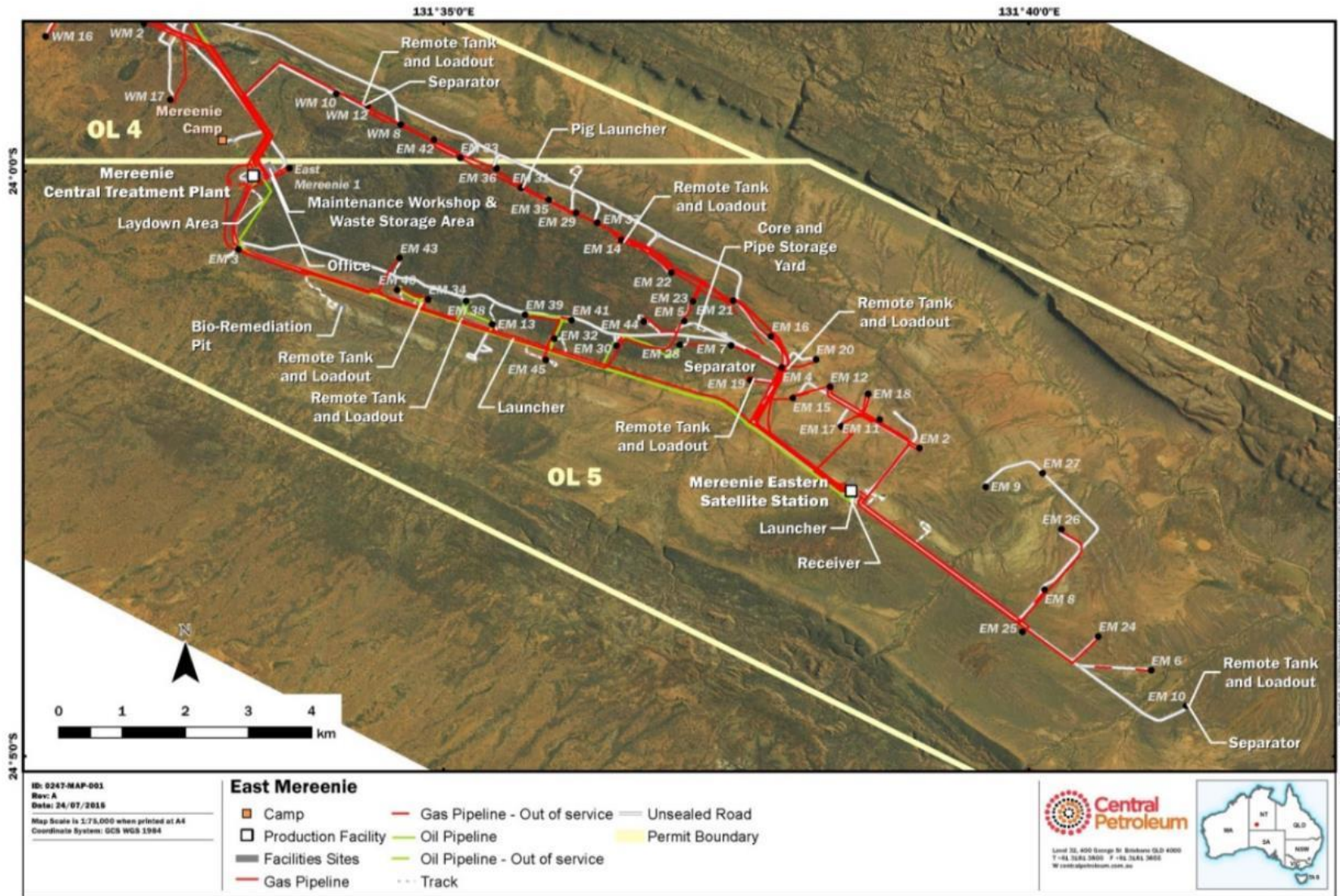


Figure 3-2 Location of the Central Treatment Plant within MRN operating licenses

3.3 Proponent

CTP is an Australian Securities Exchange (ASX) listed exploration and production company, registered on the 7th March 2006 under the Corporations Act 2001. CTP operates the largest holding of prospective onshore acreage in Australia totalling over 229,000km², predominantly in the Northern Territory, with smaller holdings in Western Australia, South Australia and Queensland.

Table 3-1. Central Petroleum company details

Company Name	Central Petroleum Limited
ACN/ABN	ABN: 95 081 592 734
Street Address	Level 7/369 Ann Street
Postal Address	PO Box 292 Brisbane, Qld 4000
Telephone	+61 (0)7 3181 3800
Facsimile	+61 (0)7 3181 3855
Key Contact	Ben Visser – General Manager Operations
Email	bervisser@centralpetroleum.com.au
Website	www.centralpetroleum.com.au

3.4 Purpose

The purpose of this EMP is to:

- Provide information to the NT Department of Primary Industry and Resources (DPIR) - Energy Directorate as required under Section 45 (1) (f) of the *Petroleum Act*;
- Provide additional information as outlined in the NT Petroleum (Environment) Regulations 2016;
- Provide information to the Northern Territory Environment Protection Authority (NT EPA) to make an assessment under the *Environmental Assessment Act*, if required;
- Communicate environmental aspects, risks, management measures and responsibilities to CTP personnel and contractors; and
- Provide a basis for environmental audits of the Works within MRN.

3.5 Scope

This EMP covers the environmental hazards and management measures relevant to activities relating to the Works at the CTPL not already covered by the approved MRN FEMP conducted by MRN personnel and contractors hired by CTP to work on site and details measures applicable from the approved MRN FEMP.

This EMP has been designed to work in conjunction with the existing approved MRN FEMP. Any identified risks or operational activities have been first referred to the existing approved MRN FEMP to determine if the activity and risk is adequately covered or if alternative controls are required.

Aspects of the Works covered by the approved MRN FEMP:

- Upgrading PLC (programmable logic controller) through replacement
- Restaging of the two existing field boost compressors
- Restarting of Plant 3

The fourth component requires ground disturbance and construction of infrastructure not explicitly covered by the approved MRN FEMP and deemed a regulated activity under the *Petroleum Act*, specifically:

- Insertion of approximately 124 piles at a depth range from 5-7m, with a diameter of 100-325mm each
- The first 2m will be hand augured to avoid any potential impact to existing infrastructure.
- Transport of infrastructure to site
- Radioactive testing of infrastructure once established.

3.6 Environmental Factors and Objectives

The relevant environmental factors (from the NT EPA Guidelines) for the Works under this EMP are outlined in Table 3-2. These factors are then mapped to the environmental objectives, anticipated impacts and mitigation measures. Importantly, the Works are being carried out on a previously disturbed area and all the risks are identified and managed to ALARP under the approved MRN FEMP. Consequently, Table 3-2 demonstrates that there are no significant impacts or risks to the environment from the Works.

This demonstrates that the Works do not have a significant effect and therefore, the activities for the CTPL upgrade do not trigger referral to the NT EPA.

Table 3-2 Environmental Factors and Objectives for the CTPL Maintenance and Upgrade works

Aspects	Environmental Factor	Objectives	Impacts and mitigation measures
Land	Biodiversity	<ul style="list-style-type: none"> No significant impact to conservation of significant fauna No significant impact to conservation significant of fauna habitat No significant impact to conservation of significant flora 	<ul style="list-style-type: none"> The Works are unlikely to impact any species of fauna of conservation significance. Please refer to the Section 5.1.13 in the approved MRN FEMP for details. The Works are unlikely to impact any area or species of flora of conservation significance. Please refer to Section 5.1.11 in the approved MRN FEMP for details. There are no threatened ecological communities within the areas required for the Works. Please refer to Section 5.1.11 in the approved MRN FEMP for details. The Works do not impact any Sites of Conservation significance. Please refer to Section 5.1.3 in the approved MRN FEMP for details. The Works do not impact any Sites of Botanical Significance. Please refer to Section 5.1.3 in the approved MRN FEMP for details. Weeds are actively managed within the operational areas. Please refer to Sections 5.1.12 and 8.2.1 in the approved MRN FEMP for details
	Soil and Landform	<ul style="list-style-type: none"> No erosion and sedimentation from the proposed piling operations Soil profile intact post piling operations 	<ul style="list-style-type: none"> Minimal soil disturbance is required for the Works and as such will unlikely to impact long term soil stability in the area. Please refer to the Section 5.1.7 in the approved MRN FEMP for details.
Water	Hydraulic processes (Groundwater and surface water)	<ul style="list-style-type: none"> No degradation to surface water quality or drainage No detrimental impact to groundwater dependant ecosystems 	<ul style="list-style-type: none"> The Works are unlikely to interact with any groundwater systems. Please refer to Section 5.1.9 in the approved MRN FEMP for details.

			<ul style="list-style-type: none"> The Works will not occur within any surface water course. Please refer to Section 5.1.8 in the approved MRN FEMP for details.
	Water quality	<ul style="list-style-type: none"> No degradation to groundwater quality No loss of groundwater amenity to surrounding users 	<ul style="list-style-type: none"> The Works are unlikely to interact with any groundwater systems. Please refer to Section 5.1.9 in the approved MRN FEMP for details. The Works are unlikely to impact water quality. Please refer to the approved MRN FEMP Section 7.6, and 8
Air	Air Quality and Noise	<ul style="list-style-type: none"> No impact to surrounding stakeholders from noise No deterioration to air quality due to operation activities 	<ul style="list-style-type: none"> The Works are unlikely to impact on sensitive receptors. Please refer to Section 5.2 in the approved MRN FEMP
People and Communities	Cultural and Heritage	<ul style="list-style-type: none"> No unauthorised disturbance to identified cultural and heritage significant sites and/or objects 	<ul style="list-style-type: none"> The Works will not impact any heritage identified areas. Please refer to Section 5.2.4 in the approved MRN FEMP for details. The area has been previously surveyed and does not contain any significant archaeological materials. Please refer to Section 5.2.5 in the approved MRN FEMP for details. The Works will not impact any CLC sacred sites. Please refer to Section 5.2.6 in the approved MRN FEMP for details.

4 CORPORATE ENVIRONMENT POLICY

4.1 Central's Commitment to the Environment

CTP has a high standard of environmental responsibility implemented through operational quality and integrity measures above and beyond industry standards. The Environmental Policy recently endorsed by the Board is shown in Figure 4-1 and the corporate Health, Safety and Environment (HS&E) policy is provided in Figure 4-2.



CENTRAL PETROLEUM LTD ENVIRONMENTAL PROTECTION POLICY

Central Petroleum Limited considers protection of the natural and social environment to be of the highest priority in all its activities, both domestic and international, and conducting its operations in an environmentally responsible manner.

It is Central Petroleum's policy to:

- Comply, at a minimum, with applicable laws, regulations, standards, codes and guidelines for the protection of the environment and cultural heritage, and in their absence, adopt the best practicable means to prevent or minimise adverse environmental and cultural heritage impacts;
- Cooperate with governments and industry in the formulation of rational and practical environmental and cultural heritage guidelines and legislation;
- Continuously develop the company's environmental management system and cultural heritage management plans to identify, control and monitor risks and compliance with government regulations and industry guidelines, utilising the most appropriate technology available;
- Commit all levels of management to accept responsibility for environmental and cultural heritage management in all Central Petroleum activities;
- Promote environmental and cultural heritage awareness in all Central Petroleum employees and contractors through induction and training programs;
- Maintain cooperative and positive relationships with indigenous people with custodial responsibility for the land where Central Petroleum operates to minimise the impact of those operations on the cultural heritage of the indigenous people, and cooperate with other legitimate land users so that, where appropriate, multiple land use is possible;
- Conduct all Company operations in such a way as to minimise disturbance to the environment, protect native flora and fauna, avoid the pollution of land, water and air, and avoid disturbance of known sites of archaeological, cultural heritage, historical, natural or scientific significance; and
- Maintain an active rehabilitation program that will restore operational areas to a condition which is compatible with the prior land use.

Richard Cottee
Managing Director
1st March 2017

Figure 4-1. CTP's corporate environmental policy



Central Petroleum Limited

CENTRAL PETROLEUM LTD HSSE POLICY

Central Petroleum Limited believes that effective management of Health, Safety, Security and Environmental (HSSE) issues is essential for success in its business, by:

- Providing leadership and commitment to HSE issues and communicating our expectations to employees, contractors and other stakeholders;
- Providing clear direction and monitoring of a zero drug and alcohol tolerance to all contractors and employees whilst involved in drilling, seismic or production activities (Operations) on site or when binding decisions relevant to Operations are required to be made;
- Zero tolerance to smoking in any workplace, except designated areas;
- Complying with national, state and local legislation;
- Providing a safe working environment for all employees, contractors and third party personnel;
- Minimising the impact of our activities on the environment;
- Selecting and managing contractors to ensure their HSE performance meets our and statutory requirements;
- Carrying out risk assessments and taking effective measures to reduce risks to as low as reasonably practicable on all our operations;
- Providing sufficient training, resources, equipment and personnel to achieve our HSE objectives;
- Maintaining appropriate HSE documentation;
- Monitoring HSE performance-investigating and reporting all incidents and accidents regularly to the Board of Directors as well as relevant authorities;
- Striving for continuous improvement;
- Ensuring effective emergency response procedures are in place;
- Supporting wherever possible the advancement of local communities in areas where we operate; and
- Conducting audits and reviews to assess compliance with this policy.
- Implementing and using management systems for integrity management of plant, pipelines and equipment.

It is the responsibility of all employees and contractors to comply with this policy and to assist Central Petroleum Limited in its implementation.

A handwritten signature in blue ink, appearing to read "R. Cottee".

Richard Cottee
Managing Director
1st March 2017

Figure 4-2. CTP's corporate HSSE policy

5 ENVIRONMENTAL LEGISLATION AND OTHER REQUIREMENTS

5.1 Legislation and Approvals

The legislation and associated approvals relevant to environmental management of the Works at MRN are listed in Table 5-1.

Table 5-1. Legislation, Consents and Approvals.

Policy Jurisdiction	Legislation
Internal	<i>Central Petroleum Environmental Protection Policy 2016</i>
Commonwealth	<i>Aboriginal Land Rights (Northern Territory) Act 1967</i>
	<i>Native Title Act 1993</i>
	<i>Aboriginal and Torres Strait Islander Heritage Protection Act 1984</i>
	<i>National Environmental Protection Council Act</i>
	<i>National Greenhouse and Energy Reporting Act</i>
	<i>Australian Heritage Council Act 2003</i>
	<i>Environmental Protection and biodiversity Conservation Act 1999</i>
Northern Territory	<i>Aboriginal Land Act 2013</i>
	<i>Work Health and Safety (National Uniform Legislation) Act 2016</i>
	<i>Public Health (General Sanitation, Mosquito Prevention, Rat Exclusion and Prevention) Regulations 1988</i>
	<i>Plant Health Act 2015</i>
	<i>Petroleum (Prospecting and Mining) Regulations Act 2001</i>
	<i>Biological Control Act 2011</i>
	<i>Northern Territory Aboriginal Sacred Sites Act 2013</i>
	<i>Bushfires Management Act 2016</i>
	<i>Control of Roads Act 2015</i>
	<i>Dangerous Goods (Road and Rail Transport Act) 2012</i>
	<i>Energy Pipelines Act 2015</i>
	<i>Environmental Assessment Act 2013</i>
	<i>Environmental Offences and Penalties Act 2011</i>
	<i>Fire and Emergency Act 2016</i>
	<i>Heritage Act 2016</i>
	<i>Petroleum (Environmental) Regulations 2016</i>
	<i>Petroleum Act 2016</i>
	<i>Petroleum (Prospecting and Mining) Regulations 2016</i>
<i>Public and Environmental Health Act 2016</i>	

	<i>Public and Environmental Health Regulations 2014</i>
	<i>Schedule of Onshore Petroleum Exploration and Production Requirements 2016 (under the Petroleum Act 2016)</i>
	<i>Soil Conservation and Land Utilisation Act 2016</i>
	<i>Territory Parks and Wildlife Act 2014</i>
	<i>Waste Management and Pollution Control Act 2016</i>
	<i>Water Act 2016</i>
	<i>Weeds Management Act 2013</i>
Operating Consents	OL4 – renewed 6 th November 2002, expires 17 th November 2023
	Mereenie Agreement 2003 (Central Land Council)

5.2 Standards and Policy

The standards and policy relevant to environmental management of the Works at MRN are listed in Table 5-2.

Table 5-2 Central Petroleum Standards and Policy

Issue	Standard and/or Policy
Erosion and sediment control	IECA and DLRM guideline and best practise principles
Land access agreements	AAPA approval and certificate
Risk Assessment	AS/NZS ISO 31000:2009 and HB 203:2006
	CTP Internal Standards
Risk Assessment	<i>MSTD09-01 v1 – Hazard Identification, Risk Management and Control.</i>
Risk Assessment	CTP Health, Safety and Environmental Management System (HS&E MS).
Environmental Management and Mitigation Measures	DPIR approved CTP MRN FEMP

6 DESCRIPTION OF ACTIVITY

6.1 Background

- The existing approved MRN FEMP covers the safe operation of the CTPL and does not contain any limiting conditions around what is encompassed (activity wise) in this plant.
- All works will be conducted within the existing operational footprint of the CTPL and workshops as approved operational areas in the existing approved MRN FEMP (Section 6.5.9).
- There is no clearing works or development of new roads required for these works. All travel will be on existing roads and access tracks in accordance with the travel policy standards as detailed in the approved MRN FEMP (Section 6.5.1).
- All staff will be accommodated within the existing camp accommodation facilities at MRN. The existing accommodation facilities are designed to hold up to 80 personnel, which will vary from time to time in accordance with measures as in the approved MRN FEMP (Section 6.5.11). It is anticipated that to complete the works there may be a requirement to accommodate up to 100 personnel at any one time over a two-month period. The extra staff will be housed within the existing camp infrastructure through bunk beds.
- Existing laydown areas and storage space will be utilised within the workshop area and within the CTPL fenced area during construction in accordance with operational areas footprint as in the approved MRN FEMP (Section 6.5.9).
- Waste and water management is in accordance with the procedures as detailed in the approved MRN FEMP (Section 6.5.12, 8.2.4 and Section 6.5.2, 8.2.4 respectively).
- All staff and contractors will be inducted into the requirements of the approved MRN FEMP (Section 9.3).
- Traffic will be managed in accordance with measures as outlined in the approved MRN FEMP (Section 6.5.1).
- Any hazardous chemicals or goods will be managed in accordance with procedures as the detailed in the approved MRN FEMP (Section 7.6 and 8).

LES has assessed all four components and deem any environmental risks by the first three components to be covered by the existing approved MRN FEMP under normal maintenance and operation of the existing CTPL infrastructure; Section 1.5 and 6.5.9 of the approved MRN FEMP.

The fourth component, which involves installation of footing posts for the new compressor and two separators, is not explicitly covered by the FEMP and is deemed a regulated activity under the *Petroleum Act*. However, the existing controls of the approved MRN FEMP will ensure the residual environmental risk of this activity is very low. The pre-existing controls in the approved MRN FEMP have been highlighted and referenced where appropriate.

6.2 Plan

The Works consist of four components:

- Upgrading PLC (programmable logic controller) through replacement
- Restaging of the two existing field boost compressors
- Restarting of Plant 3

- Addition of larger separators to replace two small separators at the inlet of the plant and addition of a new field boost compressor

The first three stages involve no new ground disturbance or increase in the environmental footprint of the approved operational area of CTPL as in the existing MRN FEMP (Section 6.5.9).

An overview of works required to complete the Works of the CTPL:

Early Works

- Survey and pothole existing underground services
- Removal of existing infrastructure (plinths)
- Construct ramps/plates for pipeline crossings

Piling for new separators and compressor

- Survey pile layouts
- Predrill
- Install piles, pile caps and supports

New Inlet separator installation

- Install separators on piles
- Install piping to separators (shutdown)
- Install E&I to separators (shutdown)

New Compressor installation

- Install compressor on piles
- Install piping to compressor (shutdown)
- Install E&I to compressor (shutdown)

Condensate Stabiliser

- Remove and replace PSV
- Remove and upgrade control valve
- Remove and replace existing pipework (minor)

Modification of Control System

- Install new hardware and update control system

K201/202 Compressor Restaging

- Remove and replace existing pipework
- Refurb and restage 2xexisting compressors

Plant 3 refurbish and installation

- Remove and replace existing pipework

- Refurbish and re-install compressors
- Maintenance of pipework will involve insitu sandblasting. All sandblasting will be conducted using GMA SpeedBlast™ Garnet, in a fully encapsulated tent to recycle the garnet

6.2.1 Site Location

All planned works are to be carried out within either of the following approved operational areas in the MRN FEMP; the MRN workshop or the fenced operational area of the CTPL (Section 6.5.9). See Figure 6-1 for location of the Works at the CTPL.

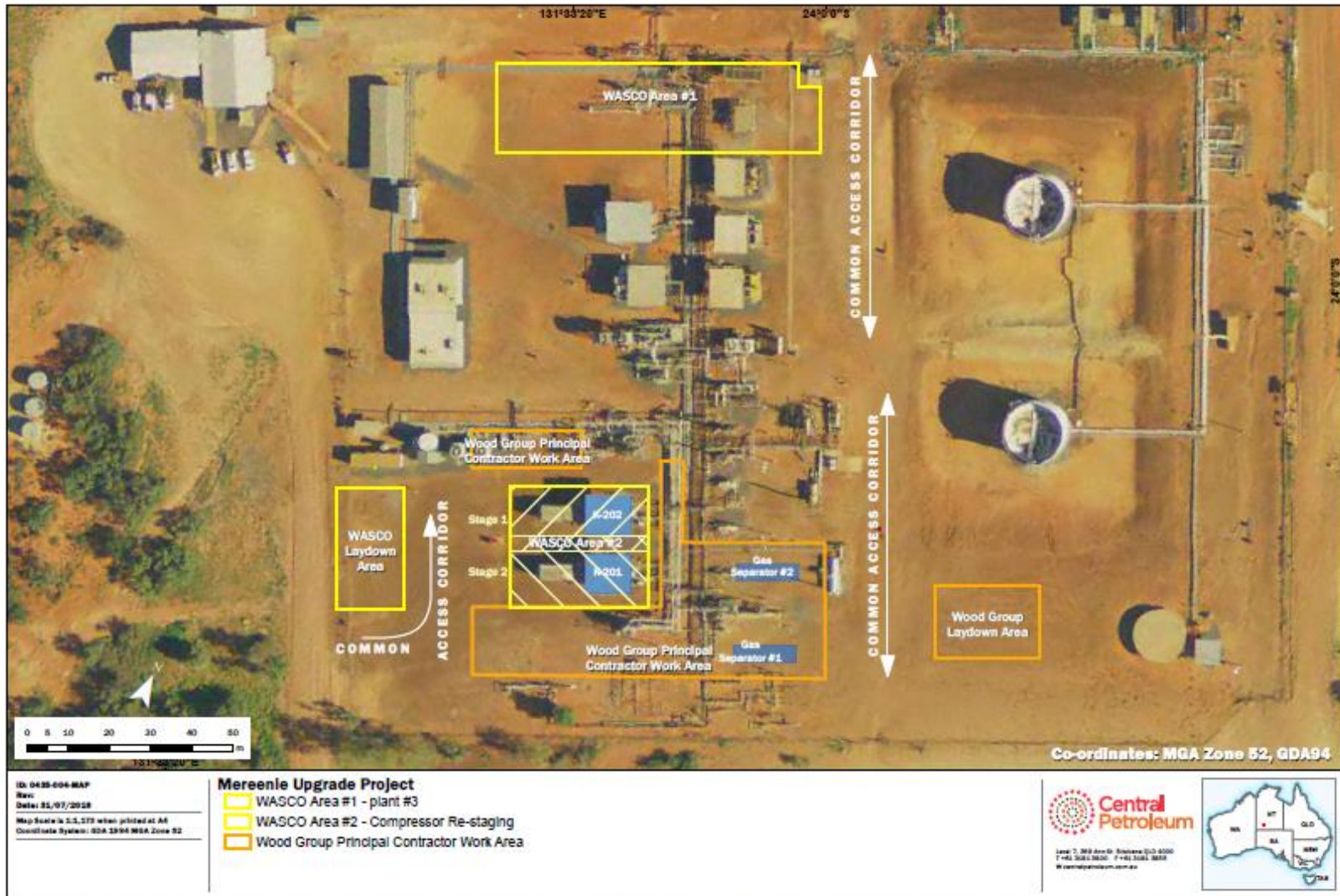


Figure 6-1 Location of maintenance and upgrade works at CTPL at MRN

6.2.2 Access

Access will be along existing sealed and unsealed roads and access tracks from Alice Springs and within MRN as detailed within the approved MRN FEMP (Section 6.5.1). A bus company will be used to transport staff from Alice Springs to MRN to reduce light vehicle traffic along the Mereenie Loop Road from Alice Springs.

The separators and compressor will be transported by road from Adelaide to Alice Springs, then along the Mereenie Loop Road to MRN.

6.2.3 Equipment Required

This Works will require extra equipment brought to site not explicitly covered under the existing approved MRN FEMP (Section 6.5.3) as listed below. It is worth noting that all this equipment (except the piling rig) would be utilised as part of normal maintenance activities, for example, during major shutdowns or pipeline integrity testing as detailed in the approved MRN FEMP (Section 6.5.8 and 6.5.5.1).

- 1x55t Franna crane
- 1x250t Franna crane
- 1xDFI RGZ130 pile rig
- Radioactive source for NDT

6.2.4 Pile Driving

- Insertion of approximately 124 piles at a depth range from 5-7m, with a diameter of 100-325mm each
- The first 2m will be hand augured to avoid any potential impact to existing infrastructure.

6.2.5 Clearing Activities

No clearing will be required, the Works are to be constructed within previously cleared, industrial use areas as approved the MRN FEMP (Section 6.5.9).

6.2.6 Camp

All staff will be accommodated within the existing camp accommodation facilities at MRN as detailed in the approved MRN FEMP (Section 6.5.11). The existing accommodation facilities are designed to hold up to 80 personnel, which will vary from time to time in accordance with the approved MRN FEMP (Section 6.5.11). It is anticipated that to complete the works there may be a requirement to accommodate up to 100 personnel at any one time over a two-month period. The extra staff will be housed within the existing camp infrastructure through bunk beds.

6.2.7 Water Use

Minimal water use will be required for the Works, with all water taken from existing MRN bores as approved in the MRN FEMP (Section 6.5.2). Any substantial water use required for the Works will be recorded (>2,000L).

6.2.8 Grey Water Disposal

All grey water produced from the MRN camp will be disposed in accordance with the existing procedures in the approved MRN FEMP (section 6.5.11 and 8.2.3).

6.2.9 Sewerage Water Disposal

All sewerage water produced at the MRN camp will be disposed in accordance with the existing procedures in the approved MRN FEMP (Section 6.5.11).

6.2.10 Waste Management

All waste to be separated and placed in appropriate area at MRN for final off-site disposal in accordance with the existing procedures in the approved MRN FEMP (Section 8.2.4).

6.2.11 Chemicals used

Any chemical or hazardous material used will be stored in the appropriate area and in accordance with the existing procedures in the approved MRN FEMP (Section 7.6 and 8).

6.2.12 Number of Staff

Total number of staff expected during the Works will vary but at peak will be within the design capacity of the existing MRN camp as in the approved MRN FEMP (Section 9.2.1), approximately 50 extra staff.

6.2.13 Timing and Duration

The Works (from initial engineering design to final punchlist closeout) will be conducted from the 9th August 2018 to 31st March 2019 weather and operations permitting. Onsite construction activities are scheduled for October and November 2018 to be outside the peak rainy season.

6.3 Closure and Rehabilitation

The minimal ground disturbance for the Works will be restored to previous condition as soon as no longer required for safe operation. The disturbance will occur within an operational area that has been previously cleared and is maintained as such. Any spoil from the pile installations will be evenly spread out over the surrounding area.

Any waste created during the works will be separated and placed in appropriate locations to be removed as per the existing procedures in the approved MRN FEMP (Section 6.5.12 and 8.2.4).

The area is actively monitored and controlled for the spread and emergence of weeds in accordance with the existing procedures in the approved MRN FEMP (Section 8.2.1)., no further weed management activities are required.

7 DESCRIPTION OF THE ENVIRONMENT

A detailed description of environmental characteristics is provided in the MRN FEMP. The Works have been assessed and are unlikely to impact on any environmental aspects of significance as all activities are within existing fenced operational areas with minimal ground disturbance.

7.1 Physical Environment

7.1.1 Climate

Weather is unlikely to impact construction as the Works are located on hardstand and access to site is all weather access. Please refer to the Section 5.1.1 approved MRN FEMP for details.

7.1.2 Landscape and Topography

Please refer to the Section 5.1.5 in the approved MRN FEMP for details.

7.1.3 Soils

Minimal soil disturbance is required for the Works and as such are unlikely to impact long term soil stability in the area. Please refer to the Section 5.1.7 in the approved MRN FEMP for details.

7.1.4 Geology

Please refer to the Section 5.1.6 in the approved MRN FEMP for details.

7.1.5 Groundwater

The Works are unlikely to interact with any groundwater systems. Please refer to Section 5.1.9 in the approved MRN FEMP for details.

7.1.6 Surface Hydrology

The Works will not occur within any surface water course. Please refer to Section 5.1.8 in the approved MRN FEMP for details.

7.2 Biological Environment

7.2.1 Vegetation types

Please refer to Section 5.1.10 in the approved MRN FEMP for details.

7.2.2 Flora

Flora records

Please refer to Section 5.1.11 in the approved MRN FEMP for details.

Flora species of conservation significance

The Works are unlikely to impact any area or species of flora of conservation significance. Please refer to Section 5.1.11 in the approved MRN FEMP for details.

7.2.3 Threatened Ecological Communities

There are no threatened ecological communities within the areas required for the Works. Please refer to Section 5.1.11 in the approved MRN FEMP for details.

7.2.4 Sites of Conservation Significance

The Works do not impact any Sites of Conservation significance. Please refer to Section 5.1.3 in the approved MRN FEMP for details.

7.2.5 Sites of Botanical Significance

The Works do not impact any Sites of Botanical Significance. Please refer to Section 5.1.3 in the approved MRN FEMP for details.

7.2.6 Introduced and weed species

Weeds are actively managed within the operational areas. Please refer to Sections 5.1.12 and 8.2.1 in the approved MRN FEMP for details.

7.2.7 Fauna

Fauna Records

Please refer to Section 5.1.13 in the approved MRN FEMP for details.

Fauna Species of Conservation Significance

The Works are unlikely to impact any species of fauna of conservation significance. Please refer to the Section 5.1.13 in the approved MRN FEMP for details.

Migratory and Marine Species

Please refer to Section 5.1.13 in the approved MRN FEMP for details.

7.2.8 Introduced Fauna Species

Please refer to Section 5.1.14 in the approved MRN FEMP for details.

7.2.9 Fire History

Please refer to Section 5.1.15 in the approved MRN FEMP for details.

7.3 Social Environment

7.3.1 Surrounding Land Tenure

Please refer to Section 5.2.1 in the approved MRN FEMP for details.

7.3.2 Historic and Current Land Use

Please refer to Section 5.2.2 in the approved MRN FEMP for details.

7.3.3 Surrounding Populated Places

Please refer to Section 5.2.3 in the approved MRN FEMP for details.

7.3.4 Heritage Areas identified EPBC PMSR

The Works will not impact any heritage identified areas. Please refer to Section 5.2.4 in the approved MRN FEMP for details.

7.3.5 Archaeological Surveys

The area has been previously surveyed and does not contain any significant archaeological materials. Please refer to Section 5.2.5 in the approved MRN FEMP for details.

7.3.6 CLC Sacred Sites Clearance Certificate

The Works will not impact any CLC sacred sites. Please refer to Section 5.2.6 in the approved MRN FEMP for details.

8 ENVIRONMENTAL RISK ASSESSMENT AND MITIGATION MEASURES

8.1 Scope

The scope of the environmental impact and risk assessment covers all aspects of the activities associated with the Works. Environmental impacts resulting from activities associated with the Works include:

- Flora and fauna
- Soil and landform
- Surface hydrology
- Groundwater
- Waste
- Air and noise emissions

The management and mitigation measures are in accordance with CTP Health, Safety and Environmental Management System (HS&E MS).

8.2 Environmental Hazard Identification, Risk Assessment and Management

Activities (or elements of activities) that have the potential for environment impact¹ have been identified and assessed for the proposed well sites in accordance with *MSTD09-01 v1 – Hazard Identification, Risk Management and Control*. The risk assessment process defined under *MSTD09-01* includes:

- Identification of all environmental hazards associated with operations;
- Consideration of the pathway of impact upon environment receptors for each hazard and the potential maximum consequence if no control measures are implemented;
- Consideration of controls that are appropriate, industry best practise and implemented to manage each hazard;
- Consideration of the likelihood (probability) of the consequence occurring with these controls in place;
- Re-consideration of the final maximum consequence that is credible once controls are implemented;
- Calculation of the environmental risk; and
- Assessment to determine if the risk is ALARP. If it is not, then consideration of further risk control measures will be implemented to reduce the risk to ALARP or to an otherwise acceptable risk level.

¹ An environmental impact is any change to the environment, whether adverse or beneficial, resulting from an activity.

The following activities are addressed:

- Ground disturbance due to pile driving

8.3 Key Definitions

Key definitions relating to risk management are provided in Table 8-1.

Table 8-1 key definitions in relation to risk management

Key Definitions	
Incident Event	An event capable of causing critical, major, moderate or minor damage to the environment or negligible damage with no significant environmental effect.
Hazard	A physical situation with the potential for damage to the environment, human injury, damage to the property or some combination of these.
Risk	The likelihood of specific undesired event occurring within a specified period or in specified circumstances. It may be either a frequency (the number of specified events occurring in a time unit) or a probability (the probability of specified event following a prior event), depending upon circumstances.

8.3.1 Risk Assessment Methodology

The purpose of this risk assessment is to identify hazards and develop risk-reducing measures to prevent and mitigate impacts from operational activities. This assessment also outlines recommended management actions that help to reduce the risk to ALARP.

Environmental risk assessment consists of five basic steps:

1. Hazard identification;
2. Risk analysis;
3. Risk evaluation;
4. Risk management; and
5. Residual Risk Analysis.

These steps are described briefly below.

8.3.1.1 Hazard Identification

Hazard identification involves identifying the sources of risk i.e. those activities or incidents that could result in an environmental impact. Hazards are categorised into those arising from routine operations, and those arising from incidents.

8.3.1.2 Risk Analysis

Risk analysis determines the likelihood of an activity or event occurring, and the consequences of that activity or event on the environment. The risk ranking matrix (Table 8-2) was used to assess the consequence and likelihood of all identified events. The matrix is based on six classifications of consequences and six for the likelihood of a hazard.

8.3.1.3 Risk Rating

Risk evaluation prioritises the risks i.e. determining if the risk of an activity or incident is acceptably low, or if management actions are required to reduce the risk to ALARP. The risk evaluation presented in Table 8-3 takes existing safeguards/management measures into consideration i.e. represents the residual risk with existing or planned safeguards in place. If there are any uncertainties in the risk rating then a safety factor has been applied to the score, increasing the risk rating.

8.3.1.4 Risk Management

Table 8-3 presents the detailed assessment of risks, impacts and their management for the proposed exploration wells. These management measures will reduce the risks to ALARP by implementing industry best practice standards and the APPEA onshore oil and gas environmental code of practice.

8.3.1.5 Residual Risk Analysis

Residual Risk is the risk rating once additional management measures have been implemented. This rating will be ALARP.

8.4 Cumulative Impacts

Cumulative impacts of the Works are low due to the lack of surrounding developments and industry. The surrounding communities have small population and limited infrastructure with most of the services provided in Alice Springs. The other major development in the area is related to TOs mustering of feral animals in which CTP has a significant role in developing and supporting. All activities are confined in areas previously disturbed and maintained as operational areas.

8.5 Risk Assessment and Mitigation Measures

Table 8-2 Risk Assessment Matrix

		Low Risk	Moderate Risk	High Risk	LIKELIHOOD – Probability of Harm / Loss					
					1	2	3	4	5	6
		Environmental Impact				Unlikely / Unknown Not expected to occur	Remote Potential May occur only on exceptional circumstances	Possible Could occur at some time	Probable Expected to occur at some time	Frequent Likely to occur regularly
CONSEQUENCES – Severity of Harm / Loss	1	Alteration/disturbance within the limits of natural variability; effects not transmitted or accumulating; resources not impaired. Minimal pollution effect contained locally.			1	2	3	4	5	6
	2	Temporary alteration/disturbance beyond natural variability; effects confined to site and not accumulating; resources temporarily affected. Minor pollution, slight or negligible impact, negligible remedial or recovery work. Short term localised and insignificant impacts to habitat or populations. Rapid recovery – measured in hours.			2	4	6	8	10	12
	3	Alteration/disturbance of a component of an ecosystem; effects not transmitted or accumulating. Pollution with some onsite impact and recovery work; possible outside assistance to contain. Incidental changes to abundance/biomass of biota in affected area; insignificant changes to overall ecological function. Recovery period measured in days – months.			3	6	9	12	15	18
	4	Alterations to one or more ecosystems or component levels, but which are recoverable; effects can be transmitted/accumulating. Significant pollution with offsite impact and recovery work. Impact that will cause a detectable effect in local ecosystem factors. Recovery period measured in months.			4	8	12	16	20	24
	5	Irreversible alteration to one or more ecosystems or several component levels; effects can be transmitted, accumulating; lost sustainability of most resources. Massive site impact and recovery work. Detrimental effect that will cause a significant effect on local ecosystem factors. Recovery period measured in years.			5	10	15	20	25	30
	6	Irreversible alteration to one or more ecosystems or several component levels; effects can be transmitted, accumulating; lost sustainability of most resources. Massive pollution with significant recovery work. Large scale detrimental effect that is likely to cause a highly significant effect on local ecosystem factors such as water quality, nutrient flow, community structure and food webs, biodiversity, habitat availability and population structure. Long term recovery period measured in decades			6	12	18	24	30	36

Table 8-3 Detailed risk assessment for the CTPL maintenance and upgrade works at MRN

Activity	Description	Hazard	C	L	Risk	Existing Mitigation Measure under FEMP	C	L	Residual Risk	Valuation and uncertainty
Pile Driving	Requires excavation of soil, temporary stockpile of soil and re-instatement once works are completed. First two meters of excavation done by hand to avoid damage to any infrastructure.	Loss of topsoil	2	2	4	Top soil managed as per approved MRN FEMP (Section 8.2.2), in low profile mounds to be re-spread limiting concentration points for erosion	1	1	1	Small temporary disturbance of soil within an existing disturbed area. Area is to remain disturbed until closure of MRN, at which stage the approved MRN FEMP rehabilitation plan (Section 12) is applicable if not superseded by a future rehabilitation plan
		Change in surface flow regimes	2	2	4	Stockpile soil for minimal time required. Re-instate soil to match the surrounding landscape	1	1	1	No water course or drainage lines directly impacted by the excavation works. All disturbances are temporary. All water course or drainage lines in the area are ephemeral (Section 6.5.8 approved MRN FEMP).
		Impact to conservation significant flora	2	2	4	Works to be contained within existing disturbed fenced area at MRN CTPL (Section 6.5.9 approved MRN FEMP). All access to the site is to be on existing roads following approved MRN FEMP traffic guidelines (Section 6.5.1). All mature trees to be avoided.	1	1	1	Area is disturbed and cleared, area is maintained clear of vegetation for safe operation as in the approved MRN FEMP (Section 6.5.9).
		Impact to conservation significant fauna	3	1	3	All waste to be managed in accordance with the approved MRN FEMP (Section 8.2.4). All works are to take place within the fenced area of the CTPL (Section 6.5.9 approved	2	1	2	All works to be contained within fenced area of CTPL (Section 6.5.9 approved MRN FEMP). Area is

Activity	Description	Hazard	C	L	Risk	Existing Mitigation Measure under FEMP	C	L	Residual Risk	Valuation and uncertainty
						MRN FEMP). If any fauna of conservation significance is noted within the Works area, work is to stop until it is removed. Any excavation open overnight is to be checked each morning for presence of fauna.				maintained fauna free to ensure safe operation of the CTPL.
Radioactive source NDT	Used for NDT, stored in a low traffic area of the workshop, identified as previous storage location of radioactive source. All hazardous and chemical management as per MRN FEMP apply.	Contamination of soil	3	2	6	Follow hazardous and chemical management procedures as outlined in the approved MRN FEMP (Section 7.6 and 8).	1	1	1	Testing devices will be carefully managed minimising risk
		Contamination to water course	3	2	6	Follow hazardous and chemical management procedures as outlined in the approved MRN FEMP (Section 7.6 and 8).	1	1	1	No watercourses and appropriate management of testing devices will minimise risk.
		Impact to conservation significant flora	3	2	6	Follow hazardous and chemical management procedures as outlined in the approved MRN FEMP (Section 7.6 and 8).	1	1	1	No flora within plant area
		Impact to conservation significant fauna	3	2	6	Follow hazardous and chemical management procedures as outlined in the approved MRN FEMP (Section 7.6 and 8).	1	1	1	Very low likelihood of fauna within plant.

Activity	Description	Hazard	C	L	Risk	Existing Mitigation Measure under FEMP	C	L	Residual Risk	Valuation and uncertainty
Construction	Hot works involved with connecting new infrastructure to existing pipework	Fire	4	2	4	<p>Follow fire management as per approved MRN FEMP (Section 7.6.6).</p> <p>Ensure adequate firefighting equipment available and up to date on site.</p> <p>All contractors made aware of the MRN FEMP and CTP emergency response plan. Maintain at least 4 m firebreaks around all hot works and flare pit. Monitor fire danger on internet source to avoid hot works on high risk days where possible.</p> <p>Avoid hot works within 4 m of any vegetation.</p>	2	1	2	All hot works to be contained within areas where hot works currently is under taking for routine maintenance or within the CTPL area, with all safety controls undertaken to avoid risk of explosion or fire as in the approved MRN FEMP (Section 8.2.6). Both areas have an actively maintained 4 m fire break as per the approved MRN FEMP (Section 8.2.6).
		Impact to conservation significant flora	3	2	6	<p>2</p> <p>1</p> <p>2</p>	2	1	2	All areas where hot works are to occur are in existing disturbed, cleared and operational areas. Wind speed and fire risk daily updated to ensure any sparks will be contained within the 4 m fire break around works in accordance with the approved MRN FEMP (Section 8.2.6).

Activity	Description	Hazard	C	L	Risk	Existing Mitigation Measure under FEMP	C	L	Residual Risk	Valuation and uncertainty
		Impact to conservation significant fauna	3	2	6		2	1	2	All areas where hot works are to occur are in existing disturbed, cleared and operational areas. Wind speed and fire risk daily updated to ensure any sparks will be contained within the 4 m fire break around works in accordance with the approved MRN FEMP (Section 8.2.6).
Transport of staff and goods to site	Increased traffic on existing roads within MRN and on public access roads to MRN entrance, bringing equipment and workers to site.	Dust	2	3	6	Follow dust and traffic mitigation measures per MRN FEMP. Extra dust suppression may be required due to increased activity with MRN. Monitor levels of dust daily and increase frequency of dust suppression as required. All transport to occur on established and maintained roads. Inform affected stakeholders of any large traffic movement on public roads. All staff change overs will occur by use of bus to limit number of light vehicles using the public access roads.	2	2	4	Increased activity is likely to produce increased dust, but for limited time of the temporary operation. Increasing frequency of existing dust suppression activities will adequately mitigate any potential increased environmental risk. Traffic will within the limits of normal operations covered by the approved MRN FEMP (Section 6.5.1). Utilisation of small buses for transport will further reduce traffic volume.
		Erosion	2	3	6	Any excessive disturbance to integrity of existing roads and tracks at MRN, to be maintained in accordance with the MRN FEMP.	2	1	2	The approved MRN FEMP has an extensive plan for management of erosion within MRN roads and tracks (Appendix 7 MRN

Activity	Description	Hazard	C	L	Risk	Existing Mitigation Measure under FEMP	C	L	Residual Risk	Valuation and uncertainty
										FEMP). As no new roads or tracks will be formed this risk will be adequately managed by following the approved MRN FEMP (Section 6.5.12 and Appendix 7).
		Impact to conservation significant flora	2	2	4	<p>Traffic management as per approved MRN FEMP (Section 6.5.12)</p> <p>No off road driving as per approved MRN FEMP (Section 6.5.12).</p> <p>Use existing tracks and roads as per approved MRN FEMP (Section 6.5.12)</p> <p>Any spill or leak of hazardous goods during transport to be immediately remediated in accordance with the approved MRN FEMP (Section 7.6 and 8) and the CTP oil spill contingency plan.</p> <p>Reporting of any spill will be in accordance to the approved MRN FEMP (Section 10.2).</p>	2	1	2	Increase in hazardous chemicals is low and mainly associated with oils for machinery. All roads and tracks used and currently maintained for access by the public and CTP staff and contractors
		Impact to conservation significant fauna	2	2	4	<p>Traffic management as per approved MRN FEMP (Section 6.5.12)</p> <p>No off road driving as per approved MRN FEMP (Section 6.5.12).</p> <p>Limited driving at dawn, dusk and night, with extra care taken to avoid potential fauna strike.</p> <p>Speed limits enforced as per approved MRN FEMP (Section 8.2.1)</p>	2	1	2	Traffic management as prescribed in the approved MRN FEMP (Section 6.5.1) will be sufficient to handle the increased traffic from these temporary works as they are within the limits of normal operations.

Activity	Description	Hazard	C	L	Risk	Existing Mitigation Measure under FEMP	C	L	Residual Risk	Valuation and uncertainty
						Existing fauna strike register maintained. Use existing tracks and roads. Any spill or leak of hazardous goods during transport to be immediately remediated in accordance with the approved MRN FEMP (Section 10.2) and the CTP oil spill contingency plan. Reporting of any spill will be in accordance to the approved MRN FEMP (Section 10.2).				

9 ENVIRONMENTAL OUTCOMES, PERFORMANCE STANDARDS AND MEASUREMENT CRITERIA

This EMP has been developed to specifically protect and ensure the integrity of the existing and surrounding environment from risks associated with the CTPL Works. This is achieved through establishment and implementation of:

- Environmental Objectives;
- Environmental Performance Standards; and
- Measurement Criteria.

The principles and practises developed in this EMP are based on Ecologically Sustainable Development (EcSD).

- Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased' (Ecological Development Steering Committee, 1992).

This EMP provides measurable procedures and practises, implemented at defined frequencies to reduce the identified risks in Section 8 to residual risks that are ALARP and acceptable by CTP management and the DPIR. This will ensure that the Works will have as minimal negative environmental impact as possible, and at completion of operations, the environment within the CTPL area will be returned to a suitable landscape conducive to future rehabilitation success and utilisation by stakeholders.

This EMP is a legally binding document and CTP will provide full disclosure of this EMP and result of audits and conformance checks against this EMP to the DPIR as required.

9.1 Environmental Objectives and Outcomes

CTP operation standards requires that environmental objectives be developed, each with corresponding targets against which performance can be measured. The environmental objectives applicable to the Works are presented in Section 8.2 of the approved MRN FEMP (Table 8-1).

The implementation of the mitigation and preventative measures to reduce environmental risks presented are as prescribed in in Section 8 of the approved MRN FEMP. The relevant sections for each environmental risk are:

- Biodiversity – Flora and fauna, (Table 8-2 approved MRN FEMP);
- Land and soil – Erosion and sediment control, (Table 8-3 approved MRN FEMP);
- Water – Hydrology and hydrogeology, (Table 8-4 approved MRN FEMP);
- Waste – Operational and produced, (Table 8-5 approved MRN FEMP);
- Air and noise – Emissions, vibration and lighting, (Table 8-6 approved MRN FEMP);
- Fire – Bushfire and operational, (Table 8-7 approved MRN FEMP); and
- Culture and heritage – Indigenous and non-indigenous, (Table 8-8 approved MRN FEMP).

10 ENVIRONMENTAL MANAGEMENT IMPLEMENTATION SYSTEM

10.1 CTP Health, Safety and Environment Integrated Management System

The feasibility, planning and assessment of the Works are undertaken within the framework of the CTP HS&E MS, which incorporates environmental management. These operating procedures are maintained as controlled documents and are available electronically. Key elements and structures associated with this system are expanded on in the approved MRN FEMP, Section 9.1.

10.2 Roles and Responsibilities

All field operations are managed by CTP. The roles and responsibilities associated with all levels of operation are described in Section 9.2 of the approved MRN FEMP.

10.3 Training and Awareness

CTP will take all steps to ensure ongoing training and awareness is conducted with all personnel and contractors. This will enable CTP, its workforce and contractors to cooperate effectively in developing and promoting measures to ensure a prominent level of HS&E knowledge and compliance. CTP's HS&E MS training and awareness include:

- Compulsory site inductions;
- Activity specific inductions;
- Pre-start (Toolbox) meetings);
- Routine HS&E meetings and reports;
- Shift handovers; and
- Dissemination and display of HS&E related information.

Details of these are provided in the approved MRN FEMP Section 9.3.

10.4 Monitoring

The MRN CTP Superintendent is responsible for organising and reporting on all monitoring undertaken at the Works.

If any incident occurs that is likely to have a significant environmental impact, the DPIR will be notified and the incident investigated and recorded.

The specific activities to be monitored internally by CTP in relation to potential impacts on environmental aspects are provided in Table 10-1 and supplemented in Section 8.2 of the approved MRN FEMP.

10.5 Auditing

Environmental audits against the performance standards and measurement criteria set out in this EMP will be conducted internally after operations are complete.

Results of these assessments form the basis for targeted improvement initiatives.

Corrective actions raised from audits and inspections are entered into the audit database for action assignment and tracking of action progress to closure.

- Audit conducted following completion of operations

The specific activities to be monitored in relation to potential impacts on environmental aspects are provided in Table 10-1 and supplemented by Section 8.2 of the approved MRN FEMP. Auditing conducted after completion of rehabilitation activities will include auditing of all activities outlined in Section 12.3 of this EMP.

Table 10-1 Monitoring and auditing requirements for the CTPL maintenance and upgrade works

Activity	Monitoring		Auditing	
	Action	Frequency	Internal/External	Frequency
ALL				
Site inductions	Records of site inductions show 100% participation by all personnel, contractors and visitors	For all new staff members and visitors before access to the site	Internal audit	At beginning of CTPL maintenance and upgrade works
SOIL AND TOPOGRAPHY				
Erosion and sedimentation on site	Records of location and size	Site inspection at beginning of operation and then following any significant rainfall events (>10mm in 24 hours)	Internal audit	Directly after site pack up
Topsoil storage	Top soil re-spread over all cleared areas no longer required for safe operation	Once after rehabilitation	Internal audit	Directly after site pack up
Erosion control	Visual inspection ensuring adequate control devices in place in accordance with DENR and IECA best practice guidelines No erosion occurring	Site inspection at beginning of operation to ensure all devices are adequate and then following any significant rainfall events (>10mm in 24 hours) to ensure integrity	Internal audit	Directly after site pack up
SURFACE WATER				
Surface water contamination	No evidence of contamination of surface water because of operations	If water course or drainage line in the area is contaminated, then a sampling and rehabilitation plan will be developed	Internal audit	If required
GROUNDWATER				
Groundwater extraction	Quantity recorded on flow meters	Extracted recorded if more than 2,000 litres	Internal audit	If required
AIR QUALITY				
Gas flare	Amount and frequency	Daily records kept of occurrence and amount of gas flared as required	Internal audit	Directly after site pack up

Activity	Monitoring		Auditing	
	Action	Frequency	Internal/External	Frequency
Dust suppression	Evidence of dust suppression activities in daily reports	Daily records taken when applicable	Internal audit	Directly after site pack up
Complaints	No records of complaints from surrounding land users regarding air quality or visual amenity	Records kept when applicable in response to incident	Internal audit	Directly after site pack up
FIRE				
Fire drills and training	Records show fire drills and training carried out and at what frequency	Frequency of at least one during works program	Internal audit	Directly after site pack up
Evidence of designated smoking areas, diesel vehicles only and firefighting equipment on site.	Visual inspection	As per MRN FEMP	Internal audit	Directly after site pack up
Unauthorised open fires	Visual inspection	As per MRN FEMP	Internal audit	Directly after site pack up
NOISE AND VIBRATIONS				
Vehicle servicing	Compliance with vehicle manufactures specifications	Before mobilisation of vehicle to site as required	Internal audit	Directly after site pack up
Complaints	No records of complaints from surrounding land users regarding noise and vibrations from operations	Records kept of any incident when applicable	Internal audit	If required
CULTURAL HERITAGE				
Interference with Aboriginal sacred sites, places or objects of archaeological significance.	Records kept of any incidents	Records kept of any incident when applicable	Internal audit	Directly after site pack up
FLORA				
No unauthorised off-road driving, all drivers	Site inspection for evidence	Weekly site inspection	Internal audit	Directly after site pack up

Activity	Monitoring		Auditing	
	Action	Frequency	Internal/External	Frequency
inducted into the potential impacts of off road driving on soil				
Weed wash downs	Every vehicle to have approved weed free certificate	Once before mobilisation to site	Internal audit	Directly after site pack up
Weed infestations	Location of any new weed infestations	Weekly during operations	Internal audit	Directly after site pack up
Declared weeds	Declared weeds managed in accordance with the <i>Weed Management Act</i> As per MRN FEMP	As required	Internal audit	Directly after site pack up
FAUNA				
Presence of introduced fauna	Record number and location	Daily during operations as required	Internal audit	Directly after site pack up
Fauna strike	Records kept in a fauna register of any sightings, near misses or strikes	Daily during operations as required	Internal audit	Directly after site pack up
Zone designated speed limits	Records of any failures to comply and corrective action taken	Daily during operations as required	Internal audit	Directly after site pack up
WASTE				
Waste streams	Records kept of quantities in and out from site	As per MRN FEMP	Internal audit	Directly after site pack up
Waste receptacles	Visual inspection of waste receptacles to ensure no fauna accessing waste storage locations	As per MRN FEMP	Internal audit	Directly after site pack up
CHEMICAL AND HAZARDOUS SUBSTANCE MANAGEMENT				
Hazardous chemical register	Records kept of quantities in and out from site	As required when applicable	Internal audit	Directly after site pack up
	All hazardous chemicals stored in either ICBs or in a bunded area in accordance with the MRN FEMP guidelines	As per MRN FEMP		Directly after site pack up

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Activity	Monitoring		Auditing	
	Action	Frequency	Internal/External	Frequency
Emergency Response and Oil Spill Contingency Plans	Visual evidence of plans on site	Once at start of operations	Internal audit	Directly after site pack up
Storage of fuel, chemicals	Visual inspection to ensure adequate bunding and containment strategies implemented	As per MRN FEMP	Internal audit	Directly after site pack up
Spills and leaks of hazardous materials	Routine visual inspection of waste and chemical storage areas to ensure no leaks or spills	Weekly during operations as required	Internal audit	Directly after site pack up
	Records kept of location, clean-up procedure and communication with DPIR regarding any leaks or spills	As required when applicable		
REHABILITATION				
Piles	Spoil respread	Directly after site pack up	Internal audit	Directly after site pack up

10.6 Continuous Improvement and Adaptive Management

CTP is committed to continual improvement and adaptive management in its HS&E MS performance. Activities undertaken as part of this commitment are summarised in Section 9.6 of the approved MRN FEMP.

10.7 Incident and Non-conformance Management

CTP's incident and non-conformance management procedures and strategies are outlined in Section 9.7 of the approved MRN FEMP.

10.8 Emergency Preparedness

CTP's emergency planning and preparedness relevant to the Works are presented in section 9.8 of the approved MRN FEMP.

10.9 Communication

Communication and consultation mechanisms undertaken by CTP in relation to the Works are summarised in section 9.9 of the approved MRN FEMP.

10.10 Commitments Table

Environmental commitments are detailed in Section 8 of the approved MRN FEMP for each environmental aspect.

11 REPORTING

11.1 Routine Reporting

CTP's routine reporting requirements are in accordance with routine reporting requirements of the approved MRN FEMP, Section 10.2.1.

11.2 Incident Reporting

11.2.1 Recordable

CTP's incident recordable requirements under the *Schedule of Onshore Petroleum Exploration and Production Requirements 2016* (the Schedule) are in accordance with Section 10.2.1 of the approved MRN FEMP.

11.2.2 Reportable

CTP's incident reporting requirements under the *Schedule of Onshore Petroleum Exploration and Production Requirements 2016* (the Schedule) are in accordance with Section 10.2.1 of the approved MRN FEMP.

Any reportable incident will be notified to the 24/7 Contact Number: Petroleum Duty Officer – Ph 1 300 935 250 within 24 hours of a reportable incident as stipulated by the *Schedule of Onshore Petroleum Exploration and Production Requirements 2016* (the Schedule).

11.3 Emissions and Discharge Reporting

Greenhouse gas emission reporting under the *National Greenhouse and Energy Reporting Act* as per the approved MRN FEMP, Table 9-1.

11.4 Operations Annual Environmental Reporting

Annual reporting requirements for this project are consistent with the requirements outlined in section 10.3 of the approved MRN FEMP.

12 REHABILITATION MANAGEMENT PLAN

12.1 Scope

Limited to disturbances caused by the Works in MRN.

12.2 Objectives

To ensure that all disturbed areas no longer required are returned to, as close as possible, the pre-existing disturbed environmental condition to not impede the operation of the CTPL, in accordance with the objectives in the approved MRN FEMP Section 11

12.3 Environmental Actions and Monitoring

Environmental audits required at the following frequency:

During operations

- Vegetation stockpiles stored separately in low profile mounds (<2m)
- Erosion and sediment control devices installed in accordance with DLRM and IECA best practice principles and guidelines
- All waste stored in accordance with the MRN FEMP
- Weed management measure in place in accordance with the MRN FEMP

Directly after cessation of operation and rehabilitation

- Any imported material is removed
- Topsoil and spoil evenly respread over any cleared area no longer required for safe operation
- Vegetation stockpiles respread
- No new weeds or invasive species
- Temporary erosion and sediment devices installed where required in accordance with IECA and DLRM best practice principles and guidelines
- No wastes or infrastructure remaining

Following first wet season

- Weeds managed as per the approved MRN FEMP Section 8.2.1
- Erosion managed as per the approved MRN FEMP Section 8.2.2

12.4 Reporting

Results of audits supplied to the DPIR with information on any corrective actions taken if required.

13 STAKEHOLDER CONSULTATION

13.1 NT Government Approval

CTP has sought all required NT government approvals and supply copies of all relevant approvals to the DPIR before any on ground work commences.

13.2 Approvals Process

CTP are seeking approval under section 401 of the 2017 Schedule of Onshore Petroleum Exploration and Production Requirements.

13.3 Commonwealth Approval

It has been determined that the Works are unlikely to cause a significant impact on species of conservation significance and therefore the EPBC Act will not be triggered for this project. No other matters of national environmental significance as defined under the EPBC Act were identified within a 20km buffer of the Works and therefore the ACT will not be triggered.

13.4 Traditional Owner Approvals

Approval from TO's has been sought and received by CTP for the Works within the CTPL fenced area as per the requirement detailed under Clause 5.2 and Clause 5.3 of the Mereenie Agreement (2003). All communications with TO's in relation to the Works can be found in the communication log as approved in the MRN FEMP Appendix 1 and 8.

13.5 Stakeholder Management

CTP is actively engaged with all stakeholders for the MRN area under the conditions as outlined in the approved MRN FEMP Section 12

13.6 Stakeholder Approvals

CTP has sought and gained approval from the CLC and Haasts Bluff Aboriginal Trust for works in the CTPL area as contained in the approved MRN FEMP Appendix 1

13.7 Communication Log

Any communications will be maintained detailing all stakeholder consultations in the approved MRN FEMP Appendix 8 communications log.

13.8 Written Responses from Stakeholders

All written responses from stakeholders will be maintained in the approved MRN FEMP Appendix 8 communication log.

14 REFERENCES

Central Petroleum Limited, 2017. *Mereenie Oil and Gas Field - Field Environmental Management Plan*, Brisbane: Central Petroleum Limited.

Ecological Development Steering Committee, 1992. *National Strategy for Ecologically Sustainable Development - Part 1 Introduction*. [Online]

Available at: <http://www.environment.gov.au/about-us/esd/publications/national-esd-strategy-part1>

[Accessed 5 July 2016].

15 APPENDICIES

Appendix 1. Example of Communications Log maintained for all operations at MRN

COMMUNICATION LOG					
(Mereenie)					
Date	Topic	Type of engagement (e.g. email)	CP contact	Stakeholder	Outcomes
1960's - 2003	Routine meetings with the effected stakeholders and Traditional owners as required	Engagement Meetings	Santos, AGL and appropriate Operators	Traditional owners and key stake-holders	Appropriate stakeholder engagement meetings as required.
Oct-16	Annual meeting with CLC.	Face to Face Meeting	Mike Herrington, James Van Rooyen	CLC and Laritja people (TO of this land)	Informal meeting about Central's word during its first year of Operatorship of the field
Nov-16	Attended White ribbon day march at Herrmannsberg	Public march	Rolf Schulte, Gary Armstrong	Herrmannsberg community	Went to support the march agaist domestic violence
Apr-17	Organising Travel to Adelaide for Anselum Impu Snr	Phone/email	David Liddle/Mark Hensel	Impu family/Centrecorp/Ian Conway	Organised funds for Anselum Impu Snr to travel to Adelaide to support Anselum Impu Jnr in hospital.
May-17	Organise living expenses for Anselum Impu Snr in Adelaide	Phone/email	David Liddle	Impu family/Ngurratjuta/Ian Conway	Organised living expenses for Anselum Impu Snr in Adelaide.
17/10/2017	Proposed 2 well program. WM 25/26	Formal application (via Email)	James van Rooyen	CLC / Traditional Owners	Proposed work scope, well locations and formal Sacred Site Clearance applied for through the CLC for the Wm 25/26 Wells.
25/10/2017	Meeting with Traditional Owners and CLC (Liaison Committee meeting)	Meeting in Alice Springs	Richard Cottee, Mike Herrington and Rolf Schulte	CLC and Laritja people (TO of this land)	Formal yearly meeting held between he traditional owners, the CLC and Central Petroleum. The past years operations were discussed and the future years operations planned. Maps and details of the two new wells WM 25 and WM 26 were revived and discussed with them at this point.
21/11/2017	New Wells - WM 25/26	Formal Letter	James van Rooyen	CLC and Laritja people (TO of this land)	Formal letter of approval indicating that the owners of the land had been consulted and the work request (two wells) had been approved.



Appendix 2. Photos showing condition of pipework requiring sandblasting

