

EP413 3D Seismic Survey Program

Environmental Management Plan

Prepared for
Norwest Energy NL
by Strategen

July 2014



STRATEGEN
environmental consultants

EP413 3D Seismic Survey Program

Environmental Management Plan

Strategen is a trading name of
Strategen Environmental Consultants Pty Ltd
Level 2, 322 Hay Street Subiaco WA
ACN: 056 190 419

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Client: Norwest Energy NL

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1. Introduction

1.1 Background

Norwest Energy NL (Norwest), as operator of the EP413 joint venture, is proposing to undertake geophysical exploration of potential shale gas resources in the Midwest region of Western Australia.

The 3D seismic survey (the survey) will be undertaken over an area comprising approximately 10 600 ha (106 km²), subject to Exploration Permit No. 413 (EP413). EP413 is located in the Arrowsmith area, approximately 250 km north of Perth along the Brand Highway between Eneabba and Dongara (Figure 1).

The purpose of this survey is to characterise the prospectivity of shale gas resources within the delineated area of EP413 and to define the location of the Beagle Fault that traverses EP413. Approximately 2% of native vegetation within the 10 600 ha area will be disturbed as a result of the survey (the survey area).

Approximately one quarter of survey area in EP413 is located within the Beekeepers Nature Reserve (Beekeepers NR) (Figure 2). Beekeepers NR was vested with the Conservation Commission of Western Australia (CCWA) in 1992 as a 'C' class Nature Reserve for the Protection of Flora, and is deemed a nature reserve under the *Conservation and Land Management Act 1984*. The reserve is managed by Department of Parks and Wildlife (DPaW) on behalf of the CCWA. Beekeepers NR is a component of the heritage place known as 'Beekeepers-Lesueur-Coomallo Area and Nambung National Park'.

Norwest referred the survey proposal to the Environmental Protection Authority (EPA) under s 38(1) of the *Environmental Protection Act 1986* in October 2013. Norwest was advised that the level of assessment was set as Assessment on Proponent Information (API) in December 2013.

The survey proposal has also been referred to Department of the Environment (DotE) under the provisions of the *Environment Protection and Biodiversity Act 1999* (EPBC Act) in December 2013. DotE determined the Survey to be a 'controlled action – assessment on preliminary documentation'.

1.2 Purpose and scope of document

This environmental management plan (EMP) has been prepared to support the environmental review document prepared for EPA to facilitate their assessment of the proposal under s 38(1) of the *Environmental Protection Act 1986*. It has been prepared to guide management of the survey by Norwest and its contractors to ensure it is implemented in an environmentally responsible manner. This EMP specifically describes the control measures that will be implemented by Norwest during the proposed survey to reduce the potential environmental impact of the survey on the environment. Key objectives of this document are to:

- detail specific information on the physical, biological and social sensitivities of the environment
- identify the potential environmental impacts of the survey on the receiving environment
- develop control measures to ensure the environmental risks associated with the survey are minimised to as low as reasonably practicable (ALARP)
- outline the relevant monitoring, review process and mitigation actions for managing potential environmental impacts of the survey.

Section 5 presents the discrete management standards that comprise the EMP. Each standard contains the proposed management actions of environmental aspects for a particular environmental consideration. The structure of each plan is as follows:

1. Description of the factor.
2. Environmental risks to be managed.
3. Environmental objectives and targets.
4. Implementation strategy (providing management actions required to achieve environmental objectives).

5. Monitoring and reporting.
6. Contingency actions to be implemented in the event of unacceptable environmental outcomes.

1.3 Relationship to existing management plans

This EMP has been prepared in accordance with the *Norwest Energy Environmental Plan for the EP413 3D Seismic Program* and the Norwest Health, Safety and Environment Management System (HSEMS).

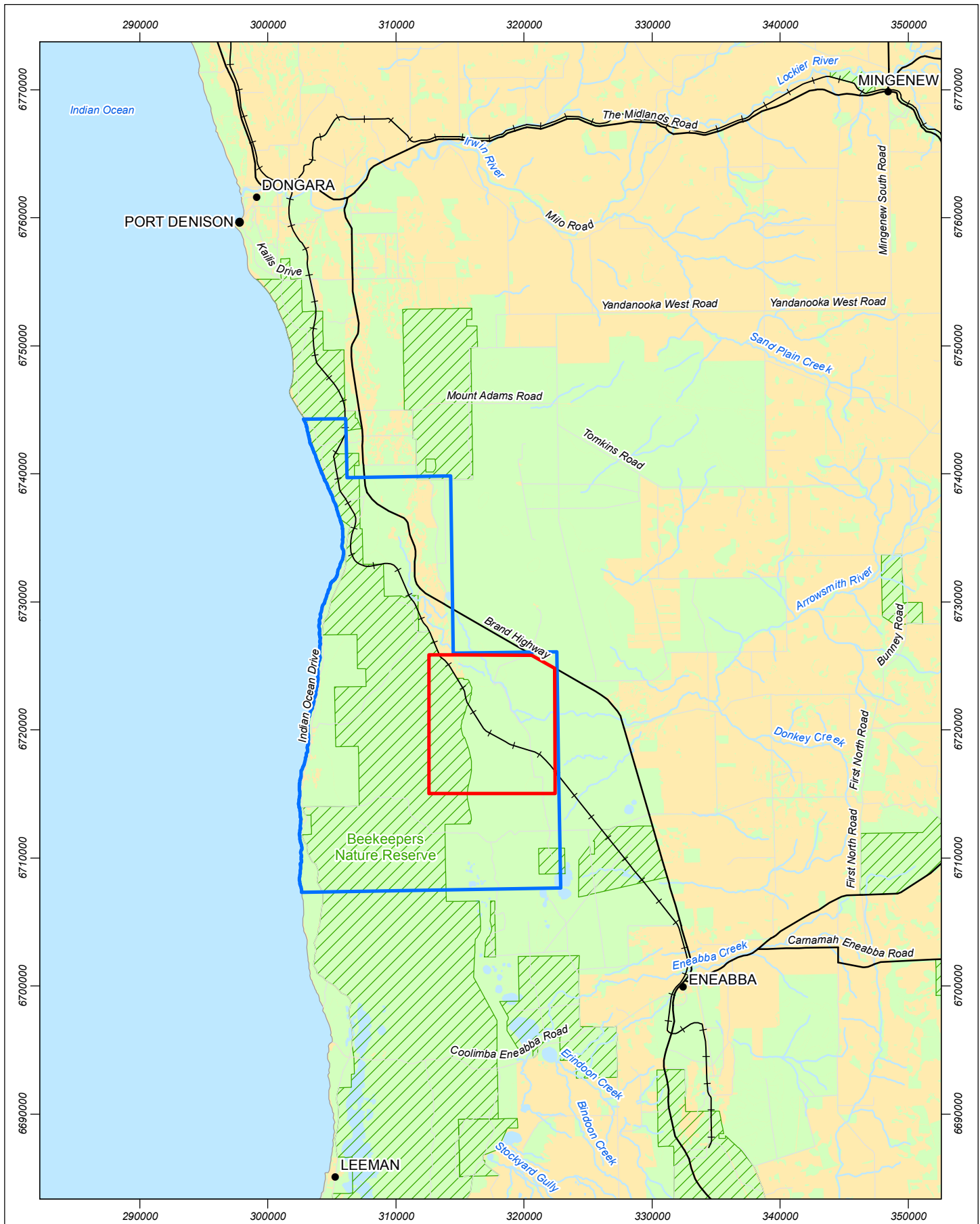


Figure 1 Locality map

Scale 1:400,000 at A4

Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 22/05/2014
 Author: JCrute
 Source: Topography: Geoscience Australia 2012.
 EP 413_DMP 2012.



Legend

- Exploration Permit EP413
- Development envelope
- Nature Reserve
- Native vegetation
- Major road
- Minor road
- Railway
- Town



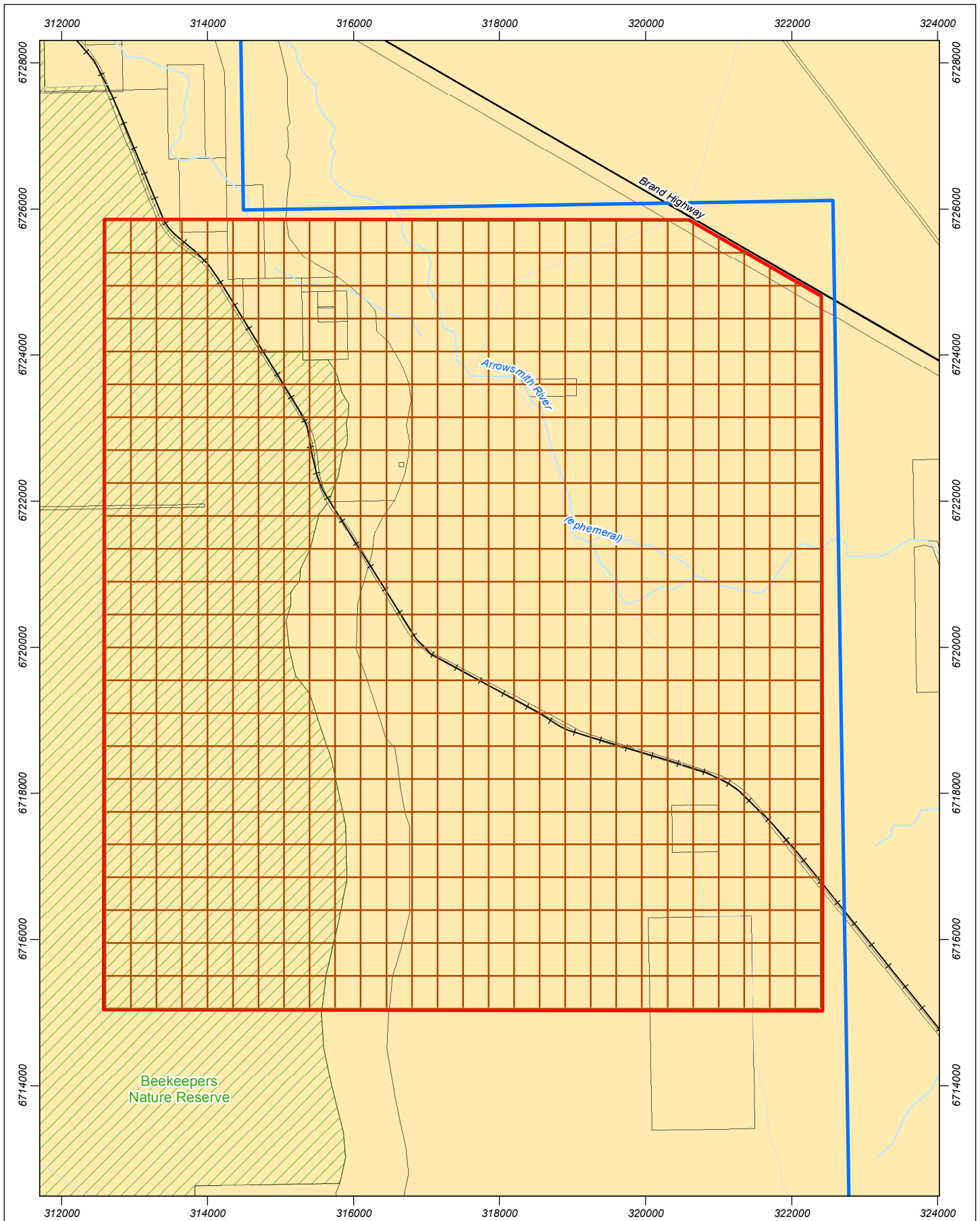
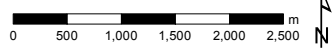


Figure 2 Survey area

Scale 1:70,000 at A4



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 22/05/2014

Author: SFinning
 Source: Roads, Reserve: Geoscience Australia 2011.
 Exploration Permit: DMP 2012. Cadastre: SLIP online, Landgate 2013.

Path: Q:\Consult\2013\NEE\NEE13184\ArcMap_documents\R005\Rev 0\NEE13184_01_R005_Rev0_F002.mxd

Legend

- Exploration Permit EP413
- Development envelope
- Disturbance footprint
- Cadastral boundaries
- Major road
- Minor road
- Drainage line
- Rail line



2. Description of the survey

The purpose of the survey is to assist with the following:

- defining the location of the Beagle Fault near the eastern boundary of Beekeepers NR, which determines the western-most extent of resource
- assessing gas field development potential east of the Beagle Fault
- planning exploration activities east of the Beagle Fault
- designing future drilling programs east of the Beagle Fault.

This survey will ensure Norwest has a clear understanding of the prospective area east of the Beagle Fault. Future exploration activities and drilling programs will only be undertaken east of the Beagle Fault and east of the boundary of Beekeepers NR.

Disturbance of native vegetation is required to provide survey line access.

2.1.1 Survey method

The main elements of the survey involve laying out a grid of receivers and detectors and conducting a seismic survey using vibroseis technology. Geophone receivers are placed along east-west oriented lines, laid using light vehicles. Geophones are inserted into the ground to approximately 100 mm depth (between 75 mm and 200 mm). Vibroseis trucks traverse north-south source lines, creating acoustic waves at regular intervals; reflected acoustic waves are received by the geophones. Data is processed then interpreted to create subsurface imaging.

2.1.2 Disturbance method

The survey will disturb up to 200 ha of native vegetation for vehicle access tracks to enable laying of geophones and traversing of vibroseis trucks.

To enable vehicle access along source and receiver lines, vegetation is mulched to create lanes of between 2.5 m and 3.6 m wide. The survey grid will be spaced at 350–450 m intervals (Figure 2). Existing roads and old (unrecovered) exploration tracks will be used where possible. The tracks will facilitate access across the area for vibroseis trucks and light vehicles to carry out the survey.

Disturbance of native vegetation will not involve broad-scale clearing. An alternative method is proposed, involving the removal of vegetation above ground level (cutting vegetation as close to the ground surface as possible) leaving topsoil and rootstock undisturbed. Greenstock will then be mulched. Mulcher capacity is limited by the girth of tree trunks and limbs, as the mulcher cannot process trunks or limbs larger than 100 mm. Where trunks or limbs of greater than 100 mm are encountered, survey lines will be deviated to avoid such vegetation. This limitation will result in more mature vegetation specimens remaining undisturbed. Deviation around larger vegetation can be managed by directing vehicles along adjacent tracks and inferring data from adjacent survey lines. In areas that present a greater risk of the presence of conservation-significant vegetation, vehicle access lanes will deviate. In order to retain the necessary levels of data acquisition where seismic lines are required to deviate, survey continuity may be maintained by hand-carrying cables and equipment through sensitive areas.

Seismic lines are prepared by a line preparation crew using maps detailing sensitive areas to be avoided. Where sensitive landforms or vegetation communities are identified, seismic lines are hand-prepared, or realigned as appropriate. A botanist will guide the survey line locations in areas identified as having Priority flora present, to ensure those species are avoided.

Vegetation will be cut as close to the ground surface as possible, and mulch immediately replaced along lanes. No stockpiling of mulch is proposed. The removal of vegetation at the ground surface, leaving seedstock within topsoil and rootstock intact, has been adopted in preference to broad scale clearing. Mulching of greenstock and immediate replacement of mulch on seismic lines will facilitate rapid and effective rehabilitation and revegetation.

This method of vegetation clearing is considered to be best practice with respect to ensuring optimal conditions for successful rehabilitation within a minimised footprint, as follows:

1. Disturbance created by cutting and mulching vegetation is of a lower order and scale than conventional clearing.
2. There is no topsoil disturbance, reducing the risks of erosion and impacts on water filtration into the thin topsoil layer containing the seed resource. In turn, this minimises the potential to leave the area prone to weed invasion.
3. Immediate return of the mulched material to its source location will ensure a maximum rate of humus production, and includes facilitation of recolonisation by microfauna (particularly burrowing invertebrates) and an increase in nutrient cycling within the topsoil.
4. Norwest is proposing the same technique as was presented as a best practice methodology by Warrego Energy regarding its West Errugulla survey.

Rolling vegetation will produce lines of damaged and partly shredded vegetation, which may affect the recovery. Rolling can also result in many uprooted plants especially in loose sandy soils typical of the North Perth Basin. In comparison, the cutting and mulching method results in a clean and stable site.

Seismic survey lines can be deviated from the nominal mapped alignments by up to approximately 15 m without losing definition in survey results. This allows survey lines to avoid rock outcrops, large trees, soaks, creek lines and other environmental values such as populations of conservation significant flora, vegetation or fauna habitat.

Seismic lines are set out on the following basis:

- using existing tracks where practical
- following natural contours
- minimising vegetation removal
- minimising soil disturbance
- avoiding windrows to prevent effects on natural drainage patterns
- deviating around avoidance areas
- discouraging third party access to lines to limit future uncontrolled access and impacts
- avoiding blocking channel or impeding water flow at creek crossings by hand-carrying cables and equipment or using naturally clear areas
- no ground disturbance to occur within the Arrowsmith River (inclusive of both banks and the riparian vegetation present) to provide protection of heritage values)
- avoiding visual corridor effects particularly in dense vegetation and at crossings by hand cutting rather than removing large trees.

2.1.3 Infrastructure

Due to the isolated nature of the operation, the survey is self-sufficient with respect to utilities and services. The previously cleared and maintained Arrowsmith-1 well location (located approximately 4.5 km off the Brand highway) is available as an equipment laydown area for use by the service provider as required for the duration of the survey.

Accommodation for personnel will utilise permanent facilities in Eneabba. Should temporary onsite accommodation be required, only existing cleared areas will be utilised and consideration will be given to

- access from a main road
- ability to deliver supplies to personnel and remove waste
- availability of water
- threat of fire
- availability of an alternative escape route.

Regardless of where the crew is accommodated, all waste will be disposed of in an appropriate manner. No rubbish is to be left in the survey area.

2.1.4 Timing and schedule

The survey is expected to take place in late 2014. The survey is expected to be undertaken over a period of approximately twelve weeks, including demobilisation and rehabilitation (excluding ongoing rehabilitation monitoring). The likely schedule will allow for a two-week mulching program, and a four-week data acquisition period within the twelve-week period. Mulching can be undertaken up to six weeks prior to data acquisition, allowing for scheduling to accommodate local fire ban regulations.

3. Proponent environmental policy and commitment

Norwest aims to achieve compliance with environmental legislation and other requirements that apply to the survey. These requirements include, but are not limited to:

- legislation and regulations administered by both Australian and State Government
- industry codes of practice
- agreements with public authorities
- non-regulatory ('best practice') guidelines.

Norwest will undertake the survey with a commitment to minimise effects to the environment to ALARP in conducting its operations.

Norwest will adopt a set of specific procedures to minimise the potential impacts associated with the survey on the surrounding environment. Key environmental objectives are outlined in each of the relevant chapters of this EMP.

3.1 Regulatory framework

Norwest acknowledges its duty of care in all aspects of the survey and the requirements of the relevant State and Commonwealth Acts and Regulations listed below:

- *Petroleum and Geothermal Energy Resources Act 1967* (PGER Act) (WA)
- Petroleum and Geothermal Energy Resources (Environment) Regulations 2012 (PGER(E)R)
- *Environmental Protection Act 1986* (EP Act) (WA)
- Environmental Protection Regulations 1987
- Environmental Protection (Clearing of Native Vegetation) Regulations 2004
- *Conservation and Land Management Act 1984* (CALM Act) (WA)
- *Wildlife Conservation Act 1950* (WC Act) (WA)
- *Aboriginal Heritage Act 1972* (AH Act)
- *Rights in Water and Irrigation Act 1914* (RIWI Act) (WA)
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth).

This EMP was prepared in accordance with the 1992 Council of Australian Government (COAG) Ecologically Sustainable Development principles, which encourage continuous improvement in environmental performance and best practice environmental management. Norwest supports these principles of continuous improvement and best practice environmental management.

3.2 Management framework

Norwest has a set of relevant health, safety and environment (HSE) standards that make up the HSEMS and against which major contractor management systems are evaluated. Site preparation and rehabilitation operations are conducted under the Contractor HSEMS.

This EMP and the *Norwest Oil Spill Contingency Plan* (OSCP) are incorporated as components of the Contractor HSEMS for the survey. Survey acquisition operations are conducted under the relevant Contractor HSEMS and are supplemented by Norwest HSEMS where any perceived gaps exist.

4. Implementation

4.1 Roles and Responsibilities

Daily management of the survey within the survey area is as specified in the Contractor HSEMS, with overarching environmental responsibility and management of the survey resting with Norwest. The allocated roles and associated responsibilities during implementation of the survey are outlined in Table 1.

Table 1 Environmental roles and responsibilities

Role	Responsibilities
Company Representative	Responsibilities of the Company representative are as follows: <ul style="list-style-type: none"> • ensure the details of all recordable incidents are suitably captured and reported • ensure all reportable HSE incidents are reported immediately to the appropriate regulatory authority • ensure all personnel involved with seismic line preparation are familiar with the requirements of this EMP • ensure all personnel and visitors comply with the Company's Environmental Policy and this EMP • ensure operations are being conducted in compliance with all relevant legislative requirements • ensure all new arrivals undertake the site induction training • ensure all incidents and hazards are reported, investigated and corrected as soon as reasonably possible • landholder liaison.
Contractor PIC (PIC)	Responsibilities of the Contractor PIC are as follows: <ul style="list-style-type: none"> • liaise with Company Representative to ensure requirements of this EMP are implemented • ensure all personnel and visitors comply with the Company's Environmental policy and this EMP • ensure operations are conducted in compliance with all relevant legislative requirements • ensure all new arrivals undertake the site induction training • ensure all incidents and hazards are reported, investigated and corrected as soon as reasonably possible • ensure regular work place inspections carried out.
All Site Project Personnel	Responsibilities of all Site Project Personnel are as follows: <ul style="list-style-type: none"> • report any environmental incidents and hazards to immediate supervisor • ensure HSE is never compromised • conduct day to day activities in an environmentally considerate manner and in compliance with the Company's environmental policy and this EMP • participate actively in environmental training programs.

4.2 Environmental induction

An induction program will be implemented prior to all staff attending the site. The induction program will include the following:

- site induction
- visitor / short term worker induction
- contractor induction.

The induction program includes training and assessment to ensure that all personnel entering the survey area are aware of their environmental responsibilities and are competent to carry out their work in an environmentally acceptable manner. Contractors and site personnel are encouraged to observe and report any potential or actual contravention of this commitment to Norwest immediately.

All personnel are required to undertake environmentally relevant training including:

- HSE induction prior to working at the survey area
- induction into the Norwest Environment Plan and the requirements of this EMP.

Training, competence and awareness of all Contractor personnel and crew will be managed by the Contractor HSSE Plan.

A Crew Toolbox (pre-start) meeting will be conducted every morning whilst on location.

4.2.1 Internal communications

All personnel are expected to communicate all environmental issues to the Company Representative and/or delegated representatives with a particular focus on items that are:

- outside their responsibility
- not adequately managed
- issues of environmental concern (e.g. near miss, incident).

The Company Representative, where appropriate, responds to all internal communication relating to the environment. All relevant internal communication relating to the environment is maintained and recorded either as memo, minutes, and/or letter.

4.2.2 External communications

Where possible, Norwest has liaised with owners of freehold land within the survey area to alert them to the nature of the survey and obtain access permission.

Landholders will be contacted again by the Company representative prior to the implementation of the survey, and kept informed regarding proposed access, activities and timelines for the duration of the seismic survey.

All personnel associated with the survey must be constantly aware that when the survey is being conducted on a Landholder's property they must conduct themselves in accordance with the terms negotiated with each private landowner to access the property.

4.2.3 Complaints procedure

All complaints regarding survey activities relating to environmental factors will be logged in a complaints register and brought to the attention of the Company Representative. Complaints will be investigated as appropriate, in conjunction with the Contractor. Complaint resolution is to be recorded and communicated to the complainant.

4.3 Incidents, corrective actions and reporting

The Contractor will provide records of any environmental incidents or corrective actions to Norwest. Norwest will notify regulatory authorities of reportable incidents as required.

In the event that monitoring required in the factor management plans relating to flora and vegetation, fauna or rehabilitation and closure indicates that the defined criteria or triggers are exceeded, or are likely to be exceeded, Norwest will:

1. Report the findings to the Director General of the Office of the Environmental Protection Authority (CEO) within two days of the exceedance being identified.
2. Investigate to determine the likely cause(s) of the trigger levels within the factor management plans being exceeded and report such findings to the CEO within seven days of the report above being submitted.

3. If determined by the CEO to be a result of activities undertaken in implementing the proposal, Norwest shall submit actions to be taken to address the exceedance within 21 days of the determination being made to the CEO.
4. Implement the actions to address the exceedance and shall continue to do so until such time the CEO determines that the actions may cease.

4.4 Emergency response

Emergencies for the purpose of this EMP include natural disasters such as bushfire, earthquake, cyclonic activity and severe winds that are outside of the control of Norwest and its contractors.

In the event of an emergency, the protection of human life is always the first priority, protection of the environment is always the second priority, and the protection and preservation of plant (equipment) is the third priority. Site-specific emergency response will be managed through the Contractor HSSE policy and procedures.

4.5 Reporting of environmental performance

Monitoring processes are designed to ensure that management actions taken are consistent with the desired environmental outcomes. Each environmental factor requires specific monitoring programs, which are detailed in individual management plans within this EMP. Implementation of this EMP will be monitored through the auditing schedule.

Norwest is responsible for:

- preparing annual environmental reports required by approvals granted by external agencies (e.g. EPA, DER, DMP and DoW) for the survey
- ensuring non-compliances have been reported and investigated where required;
- reviewing incident reports from personnel and contractors and tracking incident close out; and
- reporting to external agencies (e.g. OEPA, DER, DMP, or DoW) where an incident has led to a breach of licence or other approval requirement.

Norwest shall submit a written report of recordable incidents within 15 days of the end of each month to the Department of Mines and Petroleum (DMP) in accordance with the Petroleum and Geothermal Energy Resources (Environmental) Regulations 2012.

4.6 Audit

Environmental audits and inspections are conducted to ensure activities are completed in accordance with legal and other requirements and to deliver good environmental practice. Auditing is also utilised to ensure that the EMP is implemented in an effective manner, and to review and update the EMP and monitoring programs.

Norwest will conduct independent reviews and audits of environmental management practices and undertake an annual review of the EMP.

5. Environmental management plan

5.1 Flora and vegetation management plan

The western edge of the survey area partially overlays part of the northern Beekeepers NR, a major regional nature reserve vested with CCWA as a “C” Class Nature Reserve for the Protection of Flora in 1992. Beekeepers NR is also considered to be an environmentally sensitive area (ESA), as defined under the EP Act, and forms part of the Beekeepers-Lesueur-Coomallo Area and Nambung National Park.

No listed threatened flora species have been recorded in the survey area. Priority flora species are known to occur within the survey area. Vegetation mapping was undertaken across the survey area in 2012, with a more detailed survey carried out in 2013-14 to identify populations of priority flora species.

Known populations of Priority 1 (comprising *Scholtzia* sp. Dongara) will be re-surveyed prior to clearing by a botanist to characterise the populations in terms of size and spread, and to delineate alternative seismic survey lines around each population. This strategy is in line with management practices used to avoid potential impacts to Threatened flora.

Known populations of Priority 2 species (*Hemiandra* aff. sp. Kalbarri and *Guichenotia quasicalva*) have been deemed ‘avoidance areas’, and will be avoided during the seismic survey, where the survey design will consider alternative methods of conducting the survey within these areas to prevent or minimise potential impact to these species. As *Guichenotia quasicalva* is primarily associated with riparian vegetation of the Arrowsmith River, impacts to this species will also be minimised through avoiding riparian vegetation (see Section 5.6).

The remaining Priority species (seven Priority 3 and three Priority 4 species) are relatively numerous and particularly widespread in the south-eastern quarter of the survey area. Many of these species are associated with the limestone ridges of this area, and will consequently be avoided during the seismic survey, as the mulching equipment is unable to traverse the ridges.

No threatened ecological communities (TEC) or priority ecological communities (PEC) have been identified in the survey area.

5.1.1 Potential impacts to be managed

Potential impacts to flora and vegetation from the survey to be managed include:

- **disturbance to vegetation** for the seismic lines will temporarily reduce the extent of vegetation communities, and may disturb conservation significant flora species
- **introduction and spread of weeds and dieback** from vehicle movements
- **increased incidence/frequency of fire** from on-site ignition sources may favour the establishment of weeds and prevent the regeneration of native vegetation
- **structural changes to the vegetation** may result from disturbance to slow-growing flora species that take a long time to recover from the impacts of clearing of native vegetation.

5.1.2 Performance objectives

The environmental performance objectives, targets and indicators for flora and vegetation are detailed in Table 2 below.

Table 2 Flora and vegetation environmental objectives, targets and performance indicators

Environmental objective	Target	Performance indicators
Minimise and manage disturbance to native vegetation.	All mulching associated with line preparation is undertaken within the specified line width, alignment and methodology. No unauthorised clearing associated with the survey.	Clearing register.
Minimise soil erosion.	No mulching activities in sensitive areas such as mobile dunes and riparian vegetation of the Arrowsmith River. The extent of soil erosion along seismic lines is consistent with surrounding land.	Clearing register. Site monitoring data. Visual inspection.
Minimise disturbance to significant and sensitive flora species including threatened flora, priority flora and slow-growing flora species.	No disturbance or mulching of threatened flora species. Avoid populations of Priority 1 and 2 flora species based on targeted flora survey results. Large trees, Banksias, Zamia Palm (<i>Macrozamia</i> spp.) and Grass Trees (<i>Xanthorrhoea</i> spp.) are avoided when preparing seismic lines.	Reporting indicates that seismic lines are prepared by a line preparation crew using maps detailing areas to be avoided. Reporting indicates that where sensitive landforms (limestone ridges and riparian vegetation) are identified, seismic lines are deviated or hand-prepared. Reporting indicates that known populations of Priority 1 and Priority 2 flora have been avoided.

5.1.3 Management measures for the protection of flora and vegetation

Management measures have been identified to assist in achieving the flora and vegetation management objectives (Table 3).

Table 3 Management measures for flora and vegetation

Parameter	Management actions	Timing	Responsibility
Vegetation mulching	Induct site personnel to the EMP, including flora and vegetation management actions.	Prior to site work	Company Representative
	Area of clearing not to exceed 200 ha in total	During line planning and preparation	Company Representative Contractor PIC
	Restrict width of vehicle access lanes to a maximum of 3.6 m. Limit density of grid of vehicle access lanes to 350 m intervals.	During line planning and preparation	Company Representative Contractor PIC
	Use GPS units to follow the planned line path and orientation as closely as possible.	During line planning and preparation	Contractor PIC
	Mulch vegetation above ground level.	During mulching	Contractor PIC
	Mulched greenstock will be immediately replaced within seismic lines.	During mulching	Contractor PIC
Vehicle impact	Ensure all vehicles are kept to agreed tracks and seismic lines.	For the duration of site works	Contractor PIC
	Ensure Hygiene Management Plan is implemented (Section 5.4).	For the duration of site works	Contractor PIC
Soil compaction	Minimise vehicle travel on seismic lines to that required to undertake seismic survey.	For the duration of site works	Contractor PIC
Soil erosion	Deviate around or hand-carry wires through areas susceptible to erosion, including mobile dunes and the Arrowsmith River.	For the duration of site works	Contractor PIC
	Minimise soil disturbance during mulching of vegetation.	For the duration of site works	Contractor PIC

Parameter	Management actions	Timing	Responsibility
Significant and sensitive flora species and communities	Commissioning of a Level 2 botanical survey to identify, demarcate and map populations of conservation-significant flora and vegetation species within the survey area.	Prior to line planning and preparation (surveys undertaken between October 2013 and April 2014)	Company Representative
	Commission a botanist to define populations of Priority 1 flora and provide acceptable deviations to planned seismic lines.	During line planning and preparation	Company Representative
	Avoid all known populations of known Priority 1 and 2 flora species.	During line planning and preparation	Contractor PIC
	Seismic lines will deviate around large trees, mature <i>Banksia sp.</i> , <i>Macrozamia sp.</i> and Grass trees where possible.	During line planning and preparation	Contractor PIC
Riparian vegetation associated with Arrowsmith River	Surveyor to ground-truth location and condition of Arrowsmith River to define avoidance areas and crossing points, taking into account known populations of Priority 1 and Priority 2 species (displayed in Figure 3).	During line planning and preparation	Contractor PIC
	Stop seismic lines 20 m from the surveyed creek line of the Arrowsmith river and leave riparian vegetation intact so as to retain bank stability. Up to five additional crossings may be cleared where the bank is stable and has low slope (displayed in Figure 3).	During line planning and preparation	Contractor PIC
	Hand-carry cables and equipment to avoid damage to riparian vegetation.	For the duration of site works	Contractor PIC
	Identify and use existing constructed crossings where possible, and up to five additional crossings as agreed with Amangu Native Title claimant representatives.	During line planning and preparation	Contractor PIC
Access	Fence lines will be left intact, leaving the current number of access points unchanged.	For the duration of site works	Contractor PIC
Uncontrolled access by third parties	Obscure line access tracks near major tracks/roads so they are not readily visible to other users.	During line planning and preparation	Contractor PIC
Record keeping and reporting	Records of locations of threatened or priority flora occurring on site will be kept on-site for use during site works.	For the duration of site works	Contractor PIC
	All incidences of clearing or disturbance outside the approved areas without the necessary approval shall be reported via the incident reporting system.	For the duration of site works	Contractor PIC
	Log actual vegetation disturbance corridors using GPS.	For the duration of site works	Contractor PIC

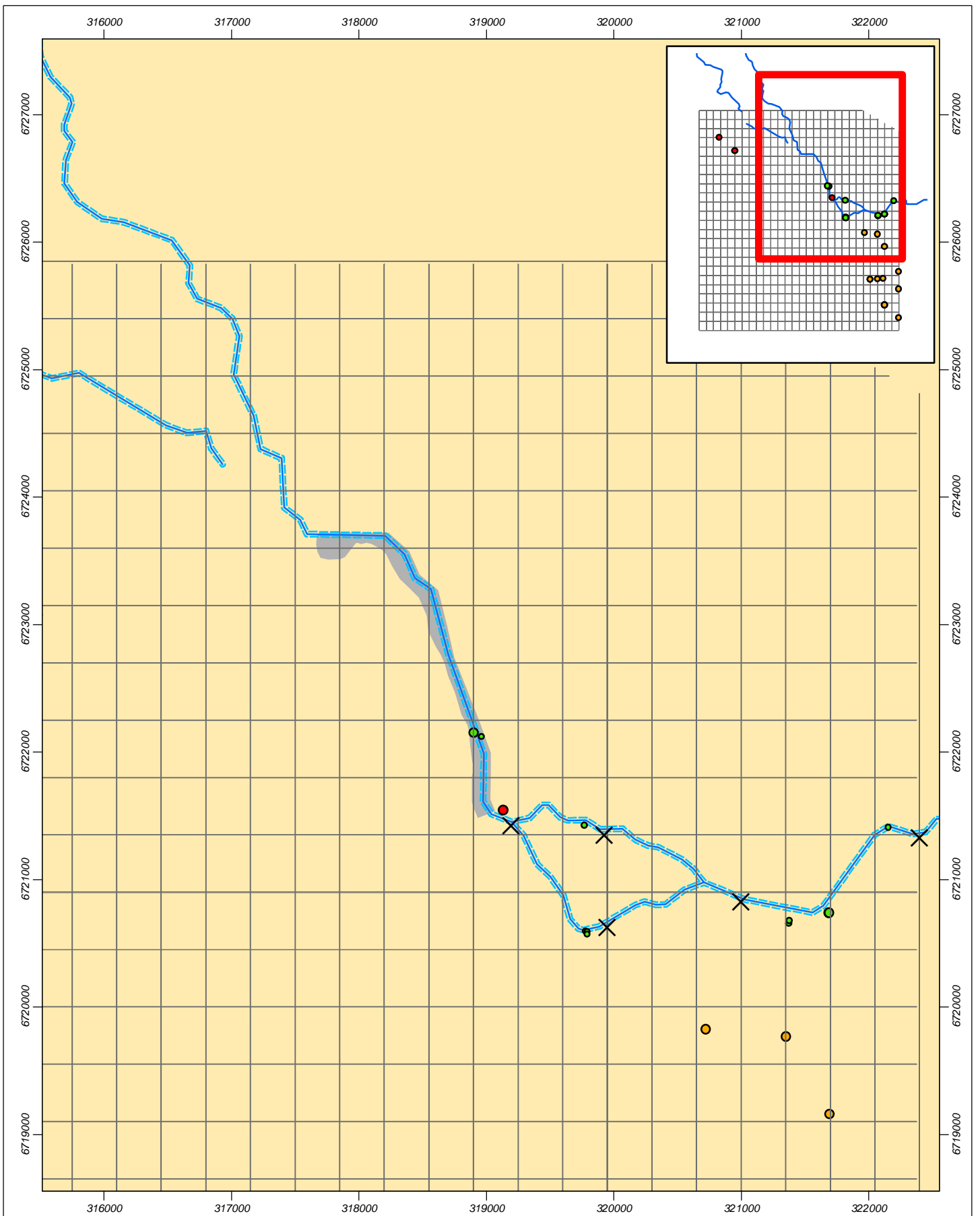
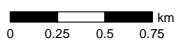


Figure 3 Proposed management strategies for Arrowsmith River

Scale 1:40,000 at A4



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 22/05/2014
 Author: SFinning
 Source: Client 2014.



Legend

X Proposed river crossings

— Arrowsmith River (ephemeral)

□ 20 m buffer either side of waterway

■ River banks not traversible

● P1, *Scholtzia* sp. Dongara (R.Hart 8401)

● P2, *Guichenotia* quasicalva

● P2, *Hemiandra* aff. sp. Kalbarri (D. Bellairs 1505)



5.1.4 Monitoring actions for flora and vegetation

Table 4 provides monitoring actions to enable assessment of the effectiveness of the flora and vegetation management actions in place.

Table 4 Flora and vegetation monitoring program

Parameter	Method	Purpose	Frequency	Location	Responsibility
Retention of significant and sensitive flora species and communities.	Visual inspection.	To determine whether significant and sensitive flora species and communities have been retained.	Weekly	All approved mulching lines.	Contractor PIC
Total area of clearing not to exceed 200 ha	Clearing register.	To ensure the maximum extent of vegetation clearing does not exceed 200 ha	During design and planning and as clearing is occurring	All approved mulching lines.	Contractor PIC
Seismic line width of up to 3.6 m; mulch retained within disturbed corridor.	Visual inspection.	To ensure that mulching is restricted to planned seismic lines and that lines are no wider than is required for vehicle access. Ensure no breach in boundaries.	Weekly	Seismic lines	Contractor PIC
Mulched material placement.	Visual inspection.	To ensure that mulched greenstock is immediately returned to site.	Opportunistic during mulching	Seismic lines	Contractor PIC
Arrowsmith River riparian vegetation left intact except for up to five additional crossings as agreed with Amangu Native Title claimant representatives.	Visual inspection.	To ensure that riparian vegetation is being protected.	As occurs	Lines crossing, or affecting the Arrowsmith River.	Contractor PIC
Soil erosion consistent with surrounding land.	Visual inspection.	Ensure that erosion control measures are adequate.	Weekly	Active seismic lines.	Contractor PIC

5.1.5 Contingency actions for flora and vegetation

Table 5 identifies the appropriate contingency actions to be initiated in the event that the performance objectives for flora and vegetation management are not met.

Table 5 Flora and vegetation contingency actions

Trigger	Action	Responsibility
Unauthorised clearing of vegetation within avoidance areas, or lane width exceeding 3.6 m width.	<ol style="list-style-type: none"> 1. Investigate cause. 2. Contact DPaW for advice and determine mitigation and management options. 3. Undertake rehabilitation of the affected area. 4. Implement incident response to prevent further breaches and unnecessary impacts, which could include: <ol style="list-style-type: none"> a. Review effectiveness of management action and identify opportunities for improvement b. Install additional flagging or temporary fencing c. Improve methods for marking mulching areas 5. Monitor the effectiveness of the remedy. 	Company Representative

Trigger	Action	Responsibility
Exceedance of clearing limits	<ol style="list-style-type: none"> 1. Investigate the cause 2. Report to the CEO as per section 4.3 3. Apply contingencies as directed by the CEO, until such time as Norwest is directed to stop work. 	Company Representative
Soil erosion occurring.	<ol style="list-style-type: none"> 1. Investigate cause. 2. Implement remedial action. 	Contractor PIC
Site works disturb sensitive flora species.	<ol style="list-style-type: none"> 1. Review the process to identify, flag and protect sensitive flora species and riparian vegetation. 2. Contact DPaW for advice regarding the conservation status of the affected species. 	Company Representative
Site works disturb riparian vegetation along the Arrowsmith River	<ol style="list-style-type: none"> 3. Report the exceedance to the CEO as per section 4.3 4. Determine mitigation and management options with advice from DPaW. 5. Implement contingencies as directed by the CEO, until such time as Norwest is directed to stop work. 	

5.2 Fauna management plan

The survey area consists of native vegetation that has the potential to support a range of native fauna, including species with conservation significance.

Several fauna listed under the EPBC Act and/or the WC Act may occur within the survey area (Table 6).

Table 6 Conservation significant fauna potentially present in the survey area

Species	Status		Comment
	WC Act/DPaW	EPBC Act	
Carnaby's Cockatoo <i>Calyptorhynchus latirostris</i>	Endangered	Endangered	Most of the survey area (>95%) comprises suitable foraging habitat for Carnaby's Cockatoo.
Malleefowl <i>Leipoa ocellata</i>	Vulnerable / Migratory	Vulnerable	One abandoned Malleefowl mound has been recorded within the survey area, and approximately one quarter of the survey area is considered to provide suitable habitat for Malleefowl.
Rainbow Bee-eater <i>Merops ornatus</i>	Migratory	n/a	Potential habitat for the Rainbow Bee-eater comprises a large proportion of the survey area; however, critical nesting habitat is unlikely to be present.
Western Ground Parrot <i>Pezoporus flaviventris</i>	Critically Endangered / Migratory	Critically Endangered	Anecdotal evidence indicates that this species may be found in the survey area. One sighting was recorded from nearby Mt Adams Road in 1992, but there have been no confirmed sightings since.
Peregrine Falcon	Specially protected	n/a	May occur. Records of this species exist in the region.
Australian Bustard	Priority 4	n/a	May occur. Records of this species exist in the region.
Western Brush Wallaby	Priority 4	n/a	Likely to occur. Records of this species exist in the region.

Installation of seismic lines will require mulching of vegetation, which has the potential to provide habitat for fauna species. Measures are proposed to reduce deaths/ injury of individual fauna during survey activities, and impacts to the condition of fauna habitat.

5.2.1 Potential impacts to be managed

Potential impacts to fauna from the survey to be managed include:

- **temporary loss of habitat** from vegetation disturbance
- **increased injuries and mortalities** from vehicle movements, infrastructure, machinery and the workforce
- **degradation of habitat** from altered hydrological regimes, increased human access, noise, dust and weed invasion
- **increased fire potential** from the presence of human activity in the area, resulting in the modification or loss of fauna habitat and conservation significant fauna
- **increase in activity of feral species** due to introduction of workforce and vehicles, inappropriate waste collection and disposal practices, and inadequate rehabilitation of disturbed land, resulting in fauna mortality and/or competition for resources.

5.2.2 Performance objectives

The environmental performance objectives and indicators for fauna are detailed in Table 7 below.

Table 7 Objectives, targets and indicators for fauna management

Environmental objective	Target	Performance indicators
Minimise disturbance to sensitive fauna habitat including Malleefowl mounds and large trees	Malleefowl mounds (active and inactive) and large trees (potential Carnaby's nesting habitat) are avoided when mulching seismic lines.	Clearing register indicates no unauthorised clearing of vegetation Site monitoring data.
Minimise direct impacts to fauna	Vehicle speeds limited to 40 km/h on bush tracks and seismic lines. Adherence to injured animal management measures. Adherence to fauna encounter procedure.	Environmental incident register.
Minimise the impact to native fauna from project related feral fauna activity	No significant increase in feral predatory fauna (fox) presence due to project activities.	Supplementation of DPaW feral fox control program in Beekeepers NR to extent of completion criteria.

5.2.3 Management measures for fauna

Management measures have been identified to assist in achieving the fauna management objectives (Table 8).

Table 8 Management measures for fauna and fauna habitat

Parameter	Management actions	Timing	Responsibility
Habitat clearing	Induct site personnel to the EMP, including fauna management actions (including identification of Malleefowl mounds).	Prior to site work	Company Representative
	Vegetation mulching will be minimised and controlled in accordance with the Flora and Vegetation Management Plan	For the duration of site works	Contractor PIC
	Implement the Weeds and Soil Pathogen Management Plan (refer to Section 5.4) for actions relating to weeds and dieback	For the duration of site works	Contractor PIC
Sensitive fauna habitat	Avoid all Malleefowl mounds (active and inactive) when mulching seismic lines	During line planning and preparation	Contractor PIC
	Avoid all large trees (potential Carnaby's habitat) i.e. with a trunk diameter of 100 mm or greater when mulching seismic lines	During line planning and preparation	Contractor PIC
Fauna interactions	Limit all vehicle travel to 40 km/hr on all bush tracks and seismic lines	For the duration of site works	Contractor PIC
	Ensure all vehicles are kept to agreed tracks and mulched lines.	For the duration of site works	Contractor PIC
	Minimise travel on seismic lines to that required to undertake seismic survey.	For the duration of site works	Contractor PIC
	Prohibit the feeding of animals, hunting, or keeping of firearms or pets on site	For the duration of site works	Contractor PIC
	Store and manage all waste	For the duration of site works	All Staff
	Operate vehicles during daylight hours	For the duration of site works	Contractor PIC
Native fauna encounter procedure	Native animals encountered on-site shall be given the opportunity to move on if there is no threat to personnel safety in doing so.	For the duration of site works	Contractor PIC
	Maintain contact details for DPaW Wildcare Helpline and approved local wildlife carers at the site office and/or in site vehicles	For the duration of site works	Contractor PIC
Injured fauna	If an injured, orphaned or sick animal is found, contact DPaW approved local wildlife carer for advice.	As required	Contractor PIC

Parameter	Management actions	Timing	Responsibility
Feral animal control	Supplement DPaW feral fox control program in Beekeepers NR.	During three year rehabilitation period	Norwest
Record keeping and reporting	Records of mapped locations of sensitive fauna habitats occurring on site will be kept on-site for use during site works.	For the duration of site works	Contractor PIC
	All incidences of fauna interactions resulting in death or injury to fauna shall be reported via the incident reporting system.	For the duration of site works	Contractor PIC
	Any disturbance of Malleefowl mounds reported via the incident reporting system.	For the duration of site works	Contractor PIC

5.2.4 Monitoring actions for fauna management

Table 9 provides monitoring actions to enable assessment of the effectiveness of fauna management actions.

Table 9 Fauna monitoring program

Parameter	Method	Purpose	Frequency	Location	Responsibility
Vehicle interactions with native fauna.	Visual inspection	To identify incidences of vehicular contact with fauna	As occurs	All access tracks and seismic lines	All drivers
Feral animal monitoring	Feral animal control reports	To identify presence of feral predators within the survey area	Once per year during implementation and rehabilitation phases	All access tracks and seismic lines	Fauna contractor

5.2.5 Contingency actions for fauna management

Table 10 identifies the appropriate contingency actions to be initiated in the event that the performance objectives for fauna management are not met.

Table 10 Fauna and fauna habitat contingency actions

Trigger	Action	Responsibility
Death of any species <i>listed under</i> WC Act 1950 or EPBC Act	<ol style="list-style-type: none"> 1. Report to DPaW staff as soon as practically possible. 2. Document within the incident reporting system. 	Contractor PIC
Injured animals	<ol style="list-style-type: none"> 1. Contact DPaW Wildcare Helpline for advice. 2. Contact approved local wildlife carer to arrange collection and care of the animal. 3. Document within the incident reporting system. 4. Report to DPaW staff as soon as practically possible. 	Contractor PIC
Unauthorised clearing of fauna habitat (i.e. exceedance of clearing limits, large trees and Malleefowl mounds) within vegetation avoidance areas.	<ol style="list-style-type: none"> 1. Identify cause. 2. Document within the incident reporting system. 3. Report to the CEO as per section 4.3 4. Ensure that seismic lines are clearly marked and habitats clearly identified. 5. Identify opportunities for remediating the damage (i.e. salvaging hollows for installation). 6. Undertake contingencies as directed by the CEO, until such time as Norwest are directed to stop work. 	Contractor PIC

5.3 Rehabilitation management plan

Land rehabilitation and a follow-up monitoring program are aimed at minimising the potential environmental impacts of the survey. Leaving soil and rootstock intact, mulching greenstock, replacing mulch and maintaining a narrow disturbance width is expected to result in good regrowth and natural recruitment following vegetation disturbance.

Norwest will close line entrances from access tracks at completion of the seismic survey (as detailed in Table 12).

5.3.1 Potential impacts to be managed

The potential impacts to rehabilitation success that require management are:

- **third-party access** to seismic lines following the survey
- **permanent or longer term access tracks** developing from seismic lines within previously isolated areas, leading to second order impacts
- **inadequate rehabilitation of seismic access lines**, including poor weed and disease control and lack of mitigation actions.

5.3.2 Performance objectives

The environmental performance objectives and indicators for rehabilitation are detailed in Table 11 below.

Table 11 Rehabilitation performance objectives and indicators

Performance objective	Target	Performance indicators
Ensure effective rehabilitation of all impacted areas once operations are completed.	All rehabilitation completion criteria set out in Table 14 are met.	Rehabilitation monitoring of completion criteria.
Potential threats of weeds and dieback are managed to facilitate rehabilitation success	No environmental incidents related to breaches of the Hygiene Management Plan.	Incident Register.
Control sediment and erosion during and after construction.	The extent of soil erosion is consistent with surrounding land.	Visual monitoring.
Disturbed areas of vegetation do not become permanent areas for vehicle access	No third party access to seismic lines once they have been closed off	Visual monitoring.

5.3.3 Management measures for rehabilitation

Management measures have been identified to assist in achieving the rehabilitation management objectives (Table 12).

Table 12 Management measures for rehabilitation

Parameter	Management actions	Timing	Responsibility
Induction	Induction of site personnel to the requirements of the rehabilitation management plan, including the impact survey activities can have on the success of rehabilitation; and the requirement for seismic line access by third parties to be minimised or excluded.	Prior to commencement of on-ground works	Company Representative
Promote successful rehabilitation	Utilise the vegetation cutting and mulching actions identified in Table 3 to retain root stock and encourage natural regeneration.	During line mulching	Contractor PIC
	Replace mulched greenstock immediately on any seismic lines.	During line mulching	Contractor PIC

Parameter	Management actions	Timing	Responsibility
	Line closure to occur within two weeks of its last use by seismic crew or ancillary activities.	Within two weeks of last use of each line (subject to requirement to access lines for emergency response)	Contractor PIC
Manage unauthorised access	Disguise access points to lines from existing tracks using an angled 'dog-leg' access.	During line mulching	Contractor PIC
	Identify line access points that may be high sensitivity or risk of unauthorised access.	During line mulching	Contractor PIC
	Disguise access points from existing tracks.	During line closure	Company representative / Contractor PIC
	Report evidence of unauthorised access to relevant land managers.	During site works	Company representative / Contractor PIC
Weed management	Implement management actions as outlined in hygiene management plan (section 5.4).	During site works	Contractor PIC
Decommissioning	All permanent markers, steel pegs or other litter to be removed on completion of survey works.	At the time of line closure	Company representative / Contractor PIC

5.3.4 Monitoring actions for rehabilitation

Table 13 provides an outline of proposed monitoring actions to enable assessment of the effectiveness of the rehabilitation management actions in place. A detailed program of post-closure rehabilitation monitoring will be prepared in close consultation with DPaW.

Table 13 Rehabilitation monitoring program

Parameters	Method	Purpose	Frequency	Location
Prevention of third party access.	Visual inspection	To ensure that regenerating lines have not been accessed by third parties (as indicated by increased rates of erosion by comparison with surrounding land, widened tracks, other indications of vehicle use).	Fortnightly until line closure.	Lines of agreed high sensitivity or risk of unauthorised access.
Maintenance of seismic line closure at intersections with existing tracks.	Visual inspection	Audit of all closed line access points.	Once, two weeks after the end of the survey, and then annually following the wet season for three years.	All access points from existing tracks.
Assess vegetation recovery against rehabilitation completion criteria (Table 14).	Visual inspection	Assess rehabilitation success.	Annually following the wet season for three years in a program to be prepared in consultation with DPaW.	Specific monitoring locations to be determined.

5.3.5 Completion criteria

Table 14 indicates the completion criteria that apply to rehabilitation actions.

Table 14 Rehabilitation Completion Criteria

Aspect	Objective	Criteria	Assessment Method
3D seismic acquisition survey	To ensure that the key actions implemented during the active seismic survey phase will assist in maximising the recovery of flora and vegetation along the seismic lines.	Flora and Vegetation Management Plan is implemented.	Vegetation monitoring.
Line closure	To ensure that all foreign items are removed.	All equipment, materials and litter are removed from the mulched seismic lines.	Visual inspection of the area of disturbance.
	To ensure no access to third parties.	All entrances to seismic lines should be closed within two weeks of their last use.	Visual inspection of access points.
		Intersections of access tracks with public roads should be disguised.	Visual inspection of access points.
Erosion	To reinstate the land to provide suitable conditions for natural recolonisation of native vegetation and support natural surface water movement.	No active erosion rills in excess of the surrounding land.	GPS record and physical measurement of any areas of erosion.
Weeds	To facilitate the establishment of native plant species along seismic lines.	The foliage cover of declared and environmental weeds should be similar to vegetation immediately adjacent to the area of disturbance after 12, 24 and 36 months.	Visual inspections. Rehabilitation monitoring.
Flora and vegetation	To facilitate the establishment of native plant species, where native vegetation has been removed during the survey process.	A minimum of 1 plant per square metre where averaged out over the seismic lines rehabilitated at 12 months.	Visual inspections. Rehabilitation monitoring.
		A minimum of 2 plants per square metre when averaged out over the seismic lines rehabilitated at 24 months.	
		A minimum of 2 plants per square metre when averaged out over the seismic lines rehabilitated at 36 months.	
		Percentage foliage cover of native species indigenous to each plant community is greater than or equal to 40% of foliage cover in vegetation immediately adjacent to the area of disturbance after 24 months.	Visual inspections. Rehabilitation monitoring.
		Percentage foliage cover of native species indigenous to each plant community is greater than or equal to 40% of foliage cover in vegetation immediately adjacent to the area of disturbance after 36 months.	Visual inspections. Rehabilitation monitoring.

Aspect	Objective	Criteria	Assessment Method
		Species richness of greater than or equal to 50% (unless negotiated differently with DPaW) in vegetation immediately adjacent to the area of disturbance after 24 months.	Visual inspections. Rehabilitation monitoring.
		Species richness of greater than or equal to 50% (unless negotiated differently with DPaW) in vegetation immediately adjacent to the area of disturbance after 36 months.	Visual inspections. Rehabilitation monitoring.
Feral fauna	No significant increase in feral fauna (fox) presence due to project activities.	Feral fauna occurrence of similar magnitude to pre-survey conditions.	Feral fauna surveys

5.3.6 Contingency actions for rehabilitation

Table 15 identifies the appropriate contingency actions to be initiated in the event that the performance objectives for rehabilitation management are not met.

Table 15 Rehabilitation contingency actions

Trigger	Action	Responsibility
Unauthorised third party access to seismic lines.	<ol style="list-style-type: none"> 1. Assess the scale of the problem. 2. Discuss alternative means of line closure with relevant land managers (private, DPaW). 	Company Representative
Weed infestation of seismic lines.	<ol style="list-style-type: none"> 1. Assess the scale of the problem. 2. Implement weed management suited to the species present, including control of priority listed weeds. 3. Follow-up monitoring annually for three years following survey completion to determine success. 	Company Representative
Erosion of soil along seismic lines at higher rates than surrounding undisturbed land.	<ol style="list-style-type: none"> 1. Identify the problem. 2. Implement erosion control as required, such as scrub-packing and mulching. 3. Follow-up monitoring annually for three years following survey completion to determine success. 	Company Representative
Completion criteria for flora and vegetation (Table 14) are not met.	<ol style="list-style-type: none"> 1. Identify the problem. 2. Report the exceedance of the rehabilitation program to the CEO as per section 4.3 3. Undertake contingency actions as directed by the CEO, until such time as Norwest are directed to stop work. Alternative rehabilitation techniques may include methods such as hand-seeding or infill planting with local native species 4. Follow-up monitoring annually for three years following survey completion to determine success. 	Company Representative

5.4 Weeds and soil pathogen management plan

Ten introduced flora species have been recorded in the survey area (O2 Ecology 2012), including the following:

- *Echium plantagineum* (Priority 1 weed)
- *Arctotheca calendula*, *Avena barbata*, *Briza maxima*, *Centaurea melitensis*, *Lysimachia arvensis*, *Sonchus oleraceus*, *Vulpia bromoides* (moderate weeds)
- *Bromus hordeaceus* (low priority weed)
- *Pennisetum setaceum* (mild weed)

Investigation of the survey area for *Phytophthora* dieback infestation was undertaken in November 2013 by Glevan Consulting. No infestations of *Phytophthora* dieback were identified in the survey area. Vegetation within the survey area is considered protectable, and hygiene principles should be applied (Glevan 2013).

Due to the significant size of the survey area, the less than favourable environmental conditions and the lack of *Phytophthora* Dieback close to the survey area, a strategic survey of the area was implemented. All possible vectors of *Phytophthora* Dieback introduction were identified during the desktop assessment, and then assessed in the field. These vectors included the rail line and associated tracks, internal sand tracks and firebreaks, creeklines and the gravel access tracks to the existing infrastructure. Possible presence of *Phytophthora* Dieback was determined through identification of symptoms and disease signatures displayed in susceptible vegetation, with broad areas allocated a dieback occurrence category. The descriptions of dieback occurrence categories are provided in Table 16.

Table 16: Dieback occurrence categories

Land area	Category	Description
Vegetated	Infested	Areas that have plant disease symptoms consistent with the presence of <i>Phytophthora</i> Dieback
	Uninfested	Areas free of plant disease symptoms that indicate the presence of <i>Phytophthora</i> Dieback
	Uninterpretable	Areas where indicator plants are absent or too few to determine the presence or absence of <i>Phytophthora</i> Dieback
	Unmappable	Areas that are sufficiently disturbed so that <i>Phytophthora</i> Dieback occurrence mapping is not possible at the time of inspection
	Not yet resolved	Areas where the interpretation process has not confidently determined the status of the vegetation
Non-vegetated	Excluded	Areas devoid of vegetation are excluded from the assessment area

Glevan (2013) interpreted 83 km of tracks in a strategic survey of likely vectors that could have introduced the disease to the survey area previously, and none were found. A summary of the *Phytophthora* dieback occurrence categories identified within the survey area is provided in Table 17. It is noted that some of the vegetation in the survey area was affected by fire, which may mask disease symptoms.

Table 17: Dieback occurrence categories of the survey area

Category	Area (ha)	% of total area
Uninterpretable	8099	72.8%
Unmappable	143	1.3%
Uninfested	2878	25.9%
Total Area	11120	100%

Following detailed investigation, Glevan (2013) has divided the survey area into two sections based on soil type, vegetation and likelihood of *Phytophthora* disease occurrence and potential impact. General hygiene principles are to be used for the entire operation, with specific attention paid to ensuring no transfer of soil and plant material from Area 2 to Area 1. Area 2 includes Beekeepers NR, and may have a lower risk in regards to potential *Phytophthora* Dieback infestation due to soil type.

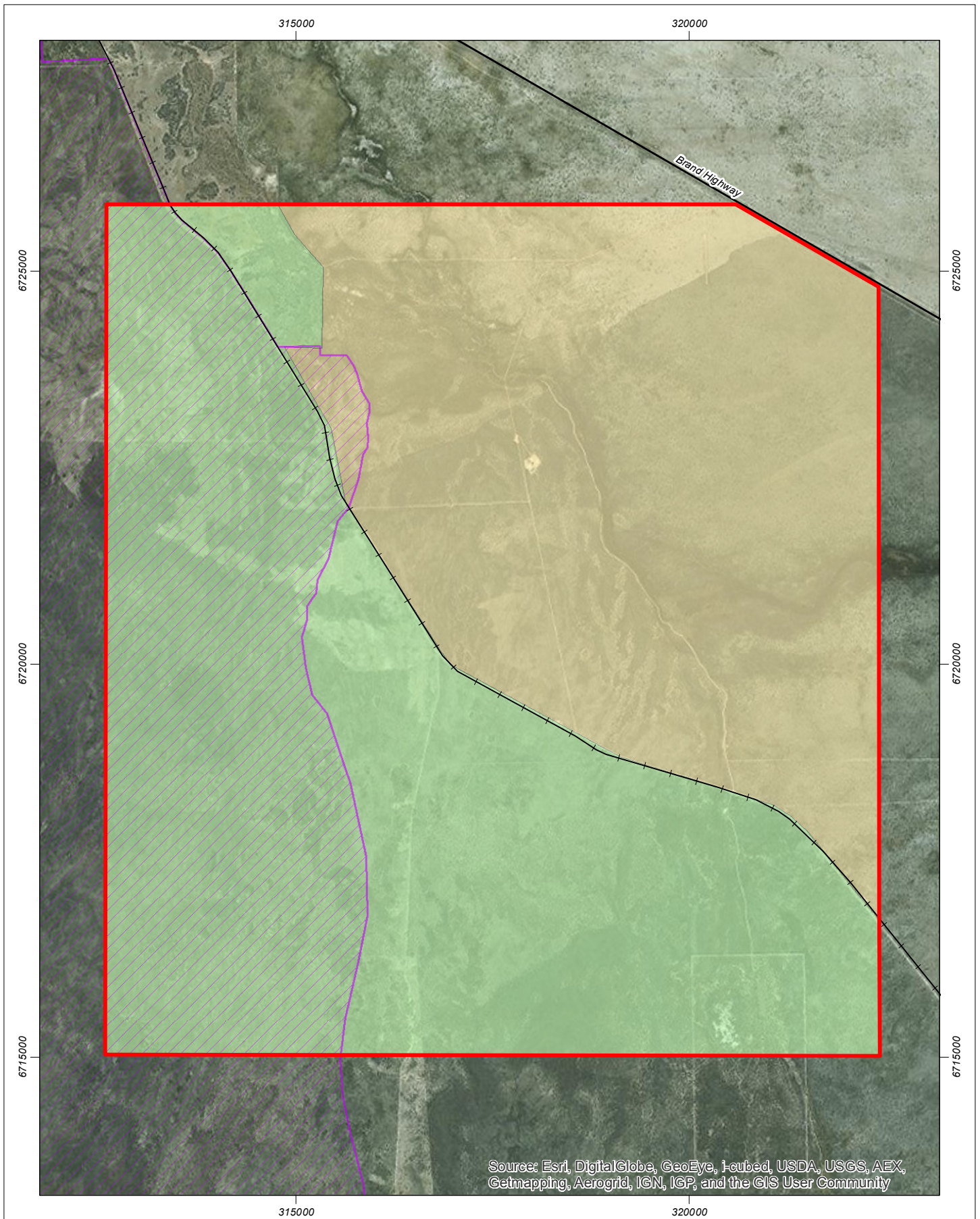
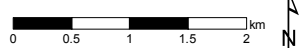


Figure 4: Mapped Phytophthora management areas

Scale 1:65,000 at A4



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 7/07/2014

Author: JCrute
 Source: Glevan Consulting 2013.

Legend

- +— Railway
- Major road
- ▨ Beekeepers Nature Reserve
- ▭ Development Envelope
- Dieback management areas
- ▭ Area 1
- ▭ Area 2



5.4.1 Potential impacts to be managed

Potential impacts from the survey related to hygiene to be managed include:

- **introduction and/or spread of weeds** from vehicle movements and site works
- **introduction of *Phytophthora dieback*** from vehicle movements and site works.

5.4.2 Performance objectives

The environmental performance objectives and indicators for hygiene are detailed in Table 18 below.

Table 18 Hygiene performance objectives and indicators

Performance objective	Target	Performance indicators
Minimise the potential for the introduction of noxious weeds, exotic species, and pathogens.	No new species of weed or pathogen that is attributable to survey activities recorded within the survey area within the rehabilitation monitoring period.	Rehabilitation monitoring Environmental incident register
Ensure no introduction of <i>Phytophthora dieback</i> to the survey area.	All vehicles and machinery are free of soil and vegetative material before arriving on-site.	Vehicle/ machinery logs

5.4.3 Management measures for weeds and *Phytophthora dieback*

Management measures have been identified to assist in achieving the hygiene management objectives (Table 19).

Table 19 Managements measures for hygiene

Parameter	Management actions	Timing	Responsibility
Planning	Undertake the seismic survey program during months with lower expected rainfall amounts.	September–April	Norwest
Induction	The induction program shall include hygiene training to ensure all personnel are aware of the requirements to prevent the spread of weeds and diseases.	Induction	Contractor PIC
Surveying	Any areas of significant weed infestation will be avoided prior to being mulched as part of the survey.	Prior to mulching being commenced	Contractor PIC
	GPS demarcation will be used to identify those areas known to contain significant weed infestations.	Prior to mulching being commenced	Contractor PIC
Access and vehicular/ machinery movement	All vehicles and machinery that will access the survey area shall be checked to ensure they are free from soil/organic matter prior to arrival on-site, and marked accordingly.	Prior to entering the survey area	Contractor PIC
Hygiene	A hygiene station(s) shall be located at the point(s) of entry from bituminised roads to unsealed tracks.	Prior to entering the survey area	Contractor PIC
	Hygiene stations will be established at the point of exit from all areas of significant weed infestation.	Prior to mulching being commenced	Contractor PIC
	A hygiene station will be located at the laydown area or site office to enable clean down prior to entry to the survey area.	Prior to mulching being commenced	Contractor PIC
	All vehicles and machinery, including handheld tools shall be cleaned to remove all soil and plant material prior to being utilised on site.	Prior to entering the survey area	Contractor PIC
	Personnel shall clean footwear prior to entering site, and when moving from areas of significant weed infestation to clean areas.	Prior to entering the survey area	All Personnel

Parameter	Management actions	Timing	Responsibility
	All vehicles and machinery, including handheld tools shall be cleaned to remove all soil and plant material prior to entering Beekeepers NR.	Prior to entering the survey area	All Personnel
	All vehicles and machinery, including handheld tools will be cleaned down to remove all soil and plant material when moving between Area 2 and Area 1.	At all times when moving from Area 2 to Area 1	All Personnel
Materials	Any organic materials brought on-site are to be demonstrated to be weed, pest and disease free.	Prior to entering the survey area	Contractor PIC
Water supply	Source water for dust management from mains or non-natural water source.	At all times	Contractor PIC

5.4.4 Monitoring actions for weeds and *Phytophthora* dieback management

Table 20 provides monitoring actions to enable assessment of the effectiveness of the hygiene management actions in place.

Table 20 Hygiene monitoring program

Parameters	Method	Purpose	Frequency	Location
Maintain cleanliness of vehicles.	Visual inspection	To ensure that all vehicles are clean of soil or vegetative matter prior to entering the survey area.	Each instance that vehicle inspection is required.	Prior to entering survey area
Maintain cleanliness of handheld tools and footwear.	Visual inspection	To ensure that hand-held tools and footwear are clean of soil or vegetative matter prior to entering the survey area.	Opportunistic	Prior to entering survey area
Characterise impact of survey on weed spread.	Visual inspection	To record incidences of weeds and their density and spread to gauge possible impacts of the survey by comparison with incidences, density and spread recorded prior to survey implementation.	12 and 24 months after completion of the survey.	Across survey area
Characterise impact of survey on presence of dieback	Visual inspection	To inspect for evidence of <i>Phytophthora</i> dieback adjacent to seismic lines.	12 months after completion of the survey.	Across survey area

5.4.5 Contingency actions

Table 21 identifies the appropriate contingency actions to be initiated in the event that the performance objectives for hygiene management are not met.

Table 21 Hygiene contingency actions

Trigger	Action	Responsibility
New infestation of weed(s) identified in areas of conservation value during the survey.	<ol style="list-style-type: none"> 1. Identify the source of the weed infestation. 2. Obtain specialist advice to undertake environmental weed control appropriate to the species and life stage of the weed infestation. Follow up environmental weed control may be required. 3. Review hygiene management procedures. 	Company Representative / Contractor PIC

Trigger	Action	Responsibility
Vehicle or machinery arrives at site without being appropriately cleaned.	<ol style="list-style-type: none"> 1. Remove vehicle or machinery from site immediately. 2. Clean vehicle or machinery at an appropriate clean down location prior to returning to site. 3. Identify cause of breach of hygiene management plan. 4. Undertake toolbox meeting to refresh the requirements of the hygiene management plan. 	Contractor PIC
Evidence of <i>Phytophthora</i> dieback recorded within survey area	<ol style="list-style-type: none"> 1. Prevent access to infested area. 2. Notify DPaW and determine appropriate course of action. 	Company Representative / Contractor PIC

5.4.6 Hygiene management procedures

The primary method for vehicle clean-down in the field will be by blow-down rather than wash-down. Wash-down is acceptable for the main site office if the vehicles are able to air dry whilst driving on bitumen road before entering the construction corridor. Vehicle wash-down in the survey area is considered inappropriate, as it would provide wet surfaces for adhesion of soils and organic materials. However, wash-down will be required on the construction corridor during significant rain events when air drying is impractical.

5.5 Waste and hazardous materials management plan

The survey will involve the use of hazardous materials such as fuels and lubricants. Inappropriate handling and/or storage of hazardous materials have the potential to result in discharges to the environment (i.e. contamination) and create health and safety hazards.

5.5.1 Potential impacts to be managed

Potential impacts from the survey related to waste and hazardous materials to be managed include:

- **contamination of waterways** from chemicals or hydrocarbons used on site
- **contamination of soil** from chemicals or hydrocarbons used on site
- **accumulation of rubbish and waste** due to presence of site workers and activities on site.

5.5.2 Performance objectives

The environmental performance objectives and indicators for waste and hazardous materials are detailed in Table 22 below.

Table 22 Waste and hazardous materials performance objectives and indicators

Performance objective	Target	Performance indicators
No contamination of waterways with chemicals or hydrocarbons as a result of the survey.	No incidents resulting in the contamination of waterways by hydrocarbons or other chemicals.	Incident register
No contamination of soil with chemicals or hydrocarbons as a result of the survey.	No incidents resulting in the contamination of soil by hydrocarbons or other chemicals.	Incident register
No rubbish left in the area of seismic operation.	No rubbish in area of seismic operation attributable to survey activities.	Visual inspection Incident register

5.5.3 Management measures for waste and hazardous materials

Management measures have been identified to assist in achieving the waste and hazardous materials management objectives (Table 23).

Table 23 Managements measures for waste and hazardous materials

Parameter	Management actions	Timing	Responsibility
Rubbish inside area of Survey	All rubbish collected in vehicles whilst on site is to be taken offsite for appropriate disposal.	For the duration of site works	All Staff
	All rubbish generated by any service and/or mechanical work conducted in the field is to be placed in the appropriate rubbish bins or container for disposal at the local council refuse station in accordance with the local refuse station regulations.	For the duration of site works	All Staff
Storage of chemicals	All hazardous materials and chemicals are to be stored in compliance with <i>Dangerous Goods Safety Act 2004</i> and associated <i>Dangerous Goods Safety Regulations 2007</i> , at a minimum.	For the duration of site works	Contractor PIC
Chemical use	MSDS for all hazardous substance on site will be supplied to the Site Supervisor/Manager prior to the substance being brought on site.	Prior to any hazardous substance being brought on site	Contractor PIC
	MSDS shall be read prior to using any substance to ensure that safe handling, storage, controls, emergency procedures and PPE are in place.	Prior to any hazardous substance being used on site	All Staff
Refuelling	No refuelling near waterways – at least 1 km buffer from mapped waterways.	For the duration of site works	Contractor PIC

Parameter	Management actions	Timing	Responsibility
	Refuelling to be undertaken at local service stations where possible, to minimise the need for on-site refuelling.	For the duration of site works	Contractor PIC
	Onsite refuelling to take place in accordance with documented Contractor procedure TS-SOP-GEN019 Refuelling in the Field (18/03/2013), or relevant updates to the identified procedure.	For the duration of site works	Contractor PIC
	Any fuel stored at the laydown area will be stored distant from the equipment or ignition sources.	For the duration of site works	Contractor PIC
Spill response	Spill kits will be located in each vehicle on site, as well as at fuel storage areas and in the mechanical workshop.	For the duration of site works	Contractor PIC
	Immediate clean-up of any contamination or spills.	As required	All Staff
	Immediate reporting of spills to site manager.	As required	All Staff
	Oil rags and other contaminated material to be disposed of in accordance with local council requirements.	As required	Contractor PIC
	Reporting to DMP, in accordance with Petroleum and Geothermal Energy Resources (Environment) Regulations 2012 in regard to recordable incidents defined as an incident arising from activity if the incident caused, or has the potential to cause, an adverse environmental impact.	As required	Company Representative

5.5.4 Monitoring actions for waste and hazardous substances

Table 24 provides monitoring actions to enable assessment of the effectiveness of the waste and hazardous materials management actions in place.

Table 24 Waste and hazardous materials monitoring program

Parameters	Method	Purpose	Frequency	Location	Responsibility
Implement appropriate waste disposal	Visual inspection	To record refuse disposal at local council refuse station <ul style="list-style-type: none"> • date of disposal • name and location of refuse station • nature of waste • receipt from refuse supervisor. 	When disposal is undertaken at local council refuse station	Survey area	Contractor PIC
Characterise impact of survey on rubbish and waste along seismic lines and in surrounding areas	Visual inspection	To record the presence of rubbish and waste.	Opportunistically	Survey area	Contractor PIC
Maintain a record of potentially-contaminating materials	Visual inspection	MSDS register present on-site and contains relevant information to the chemicals being utilised in the Survey area.	Prior to receipt of hydrocarbons and chemicals.	Storage area	Contractor PIC
Record hydrocarbon and waste spills	Visual inspection	To record the presence of spill kits at required locations..	Opportunistically	Storage area, mechanical workshop and vehicles	Contractor PIC

5.5.5 Contingency actions for waste and hazardous materials

Table 25 identifies the appropriate contingency actions to be initiated in the event that the performance objectives for waste and hazardous materials management are not met.

Table 25 Waste and hazardous materials contingency actions

Trigger	Action	Responsibility
Inappropriate storage of material	<ol style="list-style-type: none"> 1. Investigate why material is being stored inappropriately 2. Initiate action to ensure compliance 3. Amend protocol if required 	Contractor PIC
Uncontrolled release (spill) on land	<ol style="list-style-type: none"> 1. Spillages shall be immediately contained using appropriate containment methods 2. Contaminated soil or material shall be removed offsite and disposed of in an approved landfill facility 3. An environmental incident report will be completed for spills of 5 L or more. 4. Spill response action shall be investigated to ascertain if it was appropriately initiated and achieved objectives 	Contractor PIC
Uncontrolled release (spill) in a waterway	<ol style="list-style-type: none"> 1. Spillages shall be immediately contained using appropriate containment methods. 2. Containment materials will be removed offsite and disposed of in an appropriate landfill facility. 3. An environmental incident report will be completed for any spills within waterways. 4. Notification of relevant regulatory authorities (as appropriate). 5. Spill response action shall be investigated to ascertain if it was appropriately initiated and achieved objectives. 6. Review of procedures to avoid recurrences. 	Contractor PIC
Inappropriate disposal of waste	<ol style="list-style-type: none"> 1. Investigate cause of inappropriate disposal. 2. Initiate action to rectify disposal methods. 3. Amend protocol to avoid recurrences. 	Contractor PIC

5.6 Heritage management plan

A heritage survey of the survey area was carried out in November 2013 by O'Connor (2013). The heritage assessment incorporated consultation with the local native title claimants, the Amangu, including a joint site visit.

No registered Aboriginal heritage sites occur within or in close proximity to the survey area. One 'other heritage place', the Arrowsmith River is listed in the Register of Aboriginal Sites within the survey area. The listing includes the river itself up to the banks.

The Amangu native title claimant group has inspected the survey area including the Arrowsmith River. Based on this consultation and following the heritage survey it has been determined that the survey will not affect the Arrowsmith River site, under the following conditions:

- seismic work terminates at one bank
- seismic work recommences at the opposite bank.

The Amangu native title claimant group have requested that elders be engaged as monitors during the course of works in the vicinity of the Arrowsmith River.

Two crossings of the Arrowsmith River currently exist in the survey area. Clearing of the seismic lines will require up to five additional crossings in order to access the southeastern portion of the survey area. Vehicle access lanes forming additional crossings will only be mulched with the approval of the Amangu native title claimant group. Additional crossings will be mulched in the presence of the designated Amangu monitor.

5.6.1 Potential impacts to be managed

Potential impacts to heritage from the survey to be managed include:

- **impacts to Arrowsmith River Aboriginal listed site** as a result of activities associated with the survey
- **impacts to potential undiscovered heritage sites or artefacts** as a result of activities associated with the survey.

5.6.2 Performance objectives

The environmental performance objectives and indicators for heritage are detailed in Table 26 below.

Table 26 Heritage performance objectives and indicators

Performance objective	Target	Performance indicators
Comply with the requirements of the <i>Aboriginal Heritage Act 1972</i>	Protection of all sites of Aboriginal Heritage significance, both known and as yet unknown	Immediate reporting of archaeological remains if discovered. Level of disturbance to Arrowsmith River up to the banks.

5.6.3 Management measures for heritage protection

Management measures have been identified to assist in achieving the heritage management objectives (Table 27).

Table 27 Managements measures for heritage protection

Parameter	Management actions	Timing	Responsibility
Induction	Induct all staff in potential form of Aboriginal sites and artefacts.	At induction	Company Representative
Impacts to Arrowsmith River	All mulching and seismic survey work to terminate prior to the banks of the Arrowsmith river.	During site works in the vicinity of Arrowsmith River	Contractor PIC

Parameter	Management actions	Timing	Responsibility
	Engage Amangu elders to monitor survey work in the vicinity of the Arrowsmith River.	During site works in the vicinity of Arrowsmith River	Company Representative
	No ground disturbance (with the exception of planting of geophones) to occur within the Arrowsmith river, inclusive of both banks and the riparian vegetation present, with the exception of up to five additional creek crossings, subject to consultation with Amangu elders and in the presence of the designated Amangu monitor (potential crossings displayed in Figure 3).	For the duration of site works	Contractor PIC
	Stop lines preparation 20 m from the mapped creek line of the Arrowsmith river and leave riparian vegetation intact so as to retain bank stability, with the exception of up to five additional creek crossings, subject to consultation with Amangu elders and in the presence of the designated Amangu monitor (displayed in Figure 3).	During line planning and preparation	Contractor PIC
	Hand-carry cables and equipment to avoid damage to riparian vegetation.	For the duration of site works	Contractor PIC
	Identify and use existing constructed crossings.	During line planning and preparation	Contractor PIC
	Deviate lines to cross creeks in naturally-cleared areas, or where the least amount of vegetation removal is necessary to facilitate safe vehicle crossing.	During line planning and preparation	Contractor PIC

5.6.4 Monitoring actions for heritage protection

Table 28 provides monitoring actions to enable assessment of the effectiveness of the heritage management actions in place.

Table 28 Heritage monitoring program

Parameters	Method	Frequency	Location	Purpose	Responsibility
New (unrecorded) Aboriginal heritage site, artefact or skeletal remains.	Visual inspection	During survey works	All active survey areas	To ensure no new heritage sites or artefacts (e.g. currently unrecorded sites) are disturbed or destroyed by survey activities in contravention of the <i>Aboriginal Heritage Act 1972</i> .	Contractor PIC

5.6.5 Contingency actions

Table 29 identifies the appropriate contingency actions to be initiated in the event that the performance objectives for heritage management are not met.

Table 29 Heritage contingency actions

Trigger	Action	Responsibility
Previously unrecorded Aboriginal heritage site/artefact (as described in survey induction materials) is uncovered or identified	<ol style="list-style-type: none"> 1. Immediately cease active survey operations within 30 m of the potential heritage site. 2. Establish a 30 m buffer around the potential heritage site, outside which work may continue. 3. Notify Norwest appointed archaeologist and the Department of Aboriginal Affairs (DAA). The police and state coroner shall be contacted in the instance of the discovery of skeletal remains. 4. The authenticity of the site or materials shall be determined using the appropriate methods, in consultation with all relevant stakeholders. Suitable mitigation/management measures shall be undertaken as soon as possible once agreed upon. 5. Complete and forward an Incident Report to the appropriate person. 	Contractor PIC
Disturbance of an existing Aboriginal heritage site identified for protection (Arrowsmith river)	<ol style="list-style-type: none"> 1. Immediately cease work in the area of the heritage site. 2. Investigate the cause of the disturbance. 3. Implement actions to prevent the disturbance from reoccurring (e.g. marking site, toolbox meetings). 4. If necessary, consult with relevant stakeholders (e.g. DAA) to determine actions required to restore the site to its original condition. 5. Complete and forward an Incident Report to the appropriate person. 	Contractor PIC

5.7 Air quality management plan

Mulching of vegetation for survey activities and general vehicle movement along survey lines and tracks are activities with the potential to increase the risk of atmospheric dust emissions. These emissions have the potential to result in off-site environmental impacts or public concern, particularly when activities are undertaken close to major roads.

The risk of activities resulting in off-site dust emissions is generally dependent on:

- frequency of dust-generating activities within a short timeframe
- meteorological conditions, such as wind speed
- composition of dust, including particle size distribution, particle density and moisture content
- condition of the source.

5.7.1 Potential impacts to be managed

Potential impacts to air quality from the survey include:

- **Generation of visible dust** as a result of survey works that obscures visibility on the Brand Highway.

5.7.2 Performance objectives

The environmental performance objectives, targets and indicators for air quality are detailed in Table 30.

Table 30 Air quality environmental objectives, targets and performance indicators

Environmental objective	Target	Performance indicators
To minimise the temporary impact of dust emissions from survey activities, machinery and plant.	No generation of sustained dust as a result of survey works that obscures visibility on the Brand Highway.	Complaints register. Visual monitoring of dust movement during survey activities.

5.7.3 Management measures for air quality

Management measures for the protection of air quality have been identified in Table 31.

Table 31 Management measures for air quality

Parameter	Management actions	Timing	Responsibility
Consultation	Identify any local sensitive receptors (residents or other land users) and the wind conditions that increase potential impact of dust to these receptors.	Planning	Company Representative
Vehicle operation	Limit speed of vehicles to 40 km/hr within seismic survey area.	For the duration of site works	Contractor PIC
	Unnecessary movement of vehicles will be avoided.	For the duration of site works	Contractor PIC
	Ensure that all vehicle and plant are regularly maintained to minimise emission of particulates.	For the duration of site works	Contractor PIC
Clearing of vegetation	Vegetation mulching will be minimised and controlled in accordance with the Flora and Vegetation Management Plan.	For the duration of site works	Contractor PIC
	Cut vegetation as near to ground level as possible.	During mulching	Contractor PIC
Meteorological conditions	Alter work method in high winds.	As required	Contractor PIC
Soil erosion	Deviate around or hand-carry wires through areas susceptible to erosion, including mobile dunes and the Arrowsmith River.	For the duration of site works	Contractor PIC

Parameter	Management actions	Timing	Responsibility
	Minimise soil disturbance during mulching of vegetation.	For the duration of site works	Contractor PIC
Rehabilitation	Exposed areas will be rehabilitated or stabilised as soon as possible after disturbance in accordance with the Rehabilitation Management Plan (section 5.3)	As required	Contractor PIC

5.7.4 Monitoring actions for air quality

Table 32 provides monitoring actions for air quality parameters.

Table 32 Monitoring actions for air quality

Parameters	Method	Purpose	Frequency	Location	Responsibility
Vehicle and plant operation	Visual inspection	To ensure that under normal operating conditions all plant and vehicles are observed to operate without emission of particulate materials.	Opportunistic	Survey area	Contractor PIC
Dust emission	Visual inspection	To ensure that no visible dust emissions generated by survey works obscure visibility on the Brand Highway.	Opportunistic when there is potential for dust lift off	Where survey activities are in proximity to the Brand Highway	Contractor PIC

5.7.5 Contingency actions for air quality

Table 33 details the contingency actions for air quality.

Table 33 Contingency actions for air quality

Trigger	Action	Responsibility
Dust lift-off crossing Brand Highway	<ol style="list-style-type: none"> 1. Investigate the cause of dust lift-off. 2. Initiate use of water for dust suppression in areas impacting on Brand Highway. 3. Implement other dust control measures as appropriate. 4. Monitor success of remedy. 	Contractor PIC
Sustained production of particulates for vehicle or plant	<ol style="list-style-type: none"> 1. Remove vehicle or plant from operation. 2. Undertake maintenance to remedy the fault. 3. Monitor success of remedy. 	Contractor PIC

5.8 Fire management plan

Fire may be generated from many sources, and it is important to identify survey activities that may be the source of a fire. Fire in the region of the proposed survey may lead to injury or loss of life and damage to property, equipment and native vegetation. It is known that part of the survey site has been impacted by fire in recent years, and therefore some areas have lower fuel load than others. Implementation of the survey program during spring is intended to reduce the risk of fire.

This fire management plan has been developed to avoid or minimise fire risk associated with the following:

- inappropriate maintenance or use of equipment or machinery
- inappropriate handling of flammable liquids
- inappropriate storage of flammable liquids
- inappropriate disposal of cigarette butts.

5.8.1 Potential impacts to be managed

Potential impacts of fire caused by the Survey that are to be managed include:

- **loss of life and damage to property, equipment and native vegetation** caused by survey actions.

5.8.2 Performance objectives

The environmental performance objectives, targets and indicators for fire are detailed in Table 34.

Table 34 Environmental objectives, targets and performance indicators for fire prevention

Environmental objective	Target	Performance indicators
Minimise the risk of accidental fire	No fires on site attributable to activities associated with the survey	Records of fire events within the incident register.

5.8.3 Management measures for fire prevention

Management measures have been identified to assist in achieving fire prevention management objectives (Table 35).

Table 35 Management measures for fire prevention

Parameter	Management actions	Timing	Responsibility
Vehicles	Check vehicles for plant material prior to use each day.	For the duration of site works	Contractor PIC
	Do not park vehicles on stands of dry vegetation during periods of hot and dry weather conditions.	For the duration of site works	All Staff
	Ensure all vehicles are equipped with appropriate and functioning fire-fighting devices.	Prior to commencing work and for the duration of site works	Contractor PIC
Cigarettes	Implementation of 'No Smoking' policy.	For the duration of site works	All Staff
Meteorological conditions	Check Bureau of Meteorology (BOM), Department of Fire and Emergency Services (DFES), and State Emergency Service (SES) updates daily prior to commencement of work.	Daily	Contractor PIC
Clearing of vegetation	Intentional burning of vegetation shall not occur.	For the duration of site works	All Staff
Fire fighting resources	Identify local fire service, State Emergency Service and DPaW regional office and provide contact details to all site personnel.	Prior to commencing work and for the duration of site works	Contractor PIC

Parameter	Management actions	Timing	Responsibility
	Advise local fire service, State Emergency Service and DPaW regional office of commencement of survey work.	Immediately prior to commencement of survey works	Contractor PIC
	Identify local water sources and availability for fire-fighting to the survey team.	Planning	Company Representative
	Ensure adequate access to water source and required infrastructure.	For the duration of site works	Contractor PIC
Fuel storage	Any fuel stored at the laydown area will be stored distant from the equipment.	For the duration of site works	Contractor PIC

5.8.4 Monitoring actions for fire prevention

Table 36 provides monitoring actions to enable assessment of the effectiveness of the fire prevention management actions in place.

Table 36 Fire prevention monitoring program

Parameter	Method	Frequency	Location	Purpose	Responsibility
Occurrence of fires as a result of survey activities	Visual inspection	As occurs	Active survey areas	To determine if management measures are appropriate to prevent fires occurring as a result of survey activities.	All Staff
Inspection	Visual inspection	Opportunistic	Vehicles and plant	To determine if management measures are appropriate to prevent fires occurring as a result of survey activities.	Contractor PIC

5.8.5 Contingency actions for fire prevention

Table 37 identifies the appropriate contingency actions to be initiated in the event that the performance objectives for fire prevention are not met.

Table 37 Fire prevention contingency actions

Trigger	Action	Responsibility
Localised (small) fire incident	<ol style="list-style-type: none"> 1. Extinguish fire. 2. Determine the activity that caused the fire incident. 3. Review the fire management procedure and implement additional management measures as necessary to prevent another fire occurring. 	Contractor PIC
Significant fire incident	<ol style="list-style-type: none"> 1. Contact local or State Emergency Services (or other emergency response services as appropriate). 2. Implement Contractor HSE emergency response policies procedures. 3. Once fire has been extinguished and the area is deemed safe to re-enter, confer with State Emergency Services (or other emergency response services personnel as appropriate). 4. Determine the activity that caused the fire incident. 5. Review the fire management procedure and implement additional management measures as necessary to prevent another fire occurring. 6. Advise stakeholders, including landholders and regulators. 	Contractor PIC

6. Acronyms and abbreviations

Table 38 Acronyms and abbreviations used in the text

Acronym	Definition
AH Act	<i>Aboriginal Heritage Act 1972</i>
ALARP	As low as reasonably practicable
API	Assessment on Proponent Information
CALM Act	<i>Conservation and Land Management Act 1984</i>
COAG	Council of Australian Government
DAA	Department of Aboriginal Affairs
DMP	Department of Mines and Petroleum
DotE	Department of the Environment, formerly DSEWPaC
DPaW	Department of Parks and Wildlife
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
EMP	Environmental Management Plan
EP413	Exploration Permit Number 413
EP Act	<i>Environmental Protection Act 1986</i>
EPA	Environmental Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESA	Environmentally sensitive area
HSE	Health, Safety and Environment
HSEMS	Health, Safety and Environment Management System
HSSE Plan	Health, Safety, Security and Environmental Plan
MSDS	Materials Safety Data Sheet
Norwest	Norwest Energy
NR	Nature Reserve
OSCP	Oil Spill Contingency Plan
PEC	Priority Ecological Community
PGER	<i>Petroleum and Geothermal Energy Resources Act 1967</i>
PGER(E)R	<i>Petroleum and Geothermal Energy Resources (Environment) Regulations 2012</i>
PIC	PIC
Survey	3D seismic survey of EP413
Survey area	10 600 ha area of EP413 subject to the proposed 3D seismic survey
TEC	Threatened Ecological Community
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i>
WC Act	<i>Wildlife Conservation Act 1950</i>

7. References

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