

Jemena Northern Gas Pipeline Pty Ltd

Northern Gas Pipeline

Draft Environmental Impact Statement

APPENDIX H – BIODIVERSITY MANAGEMENT PLAN

Public

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Northern Gas Pipeline Construction Biodiversity Management Plan

Jemena Pty Ltd



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1 INTRODUCTION

This Biodiversity Management Plan (BMP) is a supporting document to the Environmental Impact Statement (EIS) for the Jemena Northern Gas Pipeline (NGP) project; it forms a component of the Construction Environmental Management Plan (CEMP). The environmental risk assessment conducted as part of the EIS process identified a number of potential impacts to biodiversity associated with the NGP project activities.

This BMP (Construction) outlines the measures that will be implemented during the project construction phase to mitigate environmental risks to 'as low as reasonably practicable', so that the potential impacts of the NGP project on biodiversity and on threatened species are minimised.

This BMP is only applicable to the construction and commissioning phases of the NGP, and does not include activities conducted in the operation or decommissioning stages of the project. Any required measures to avoid, mitigate and monitor impacts to biodiversity during the operational phase will be detailed in the Operations Environmental Management Plan.

1.1 Scope and objectives

The scope of the BMP is to:

- Summarise the existing biodiversity values along the NGP.
- Outline the risk and potential impact to those values due to NGP construction.
- Specify the biodiversity management framework and specific mitigation measures to minimise the impact to those values.
- Establish the monitoring and reporting framework that will ensure and document the effectiveness of the mitigation measures.
- Stipulate the incident management process.

The BMP has been developed to meet the requirements of the EIS Terms of Reference. It does not currently address the management of threatened species or sensitive regional ecosystems that are specific to Queensland. Once regional ecosystem mapping has been undertaken, the BMP will be updated to incorporate those values (where required).

To achieve the defined purpose and within the scope, the objectives of the BMP are to:

- Comply with all applicable legislation, regulations, guidelines and conditions as well as approved recovery plans and biodiversity conservation information.
- Minimise impacts to biodiversity values through ensuring that appropriate measures and procedures are implemented during construction activities.
- Develop monitoring and reporting which ensures appropriate measures are being implemented and are effective.
- Minimise the impacts to biodiversity through unforeseen incidents by developing and enacting appropriate incident response measures.

1.2 NGP project overview

The NGP is a gas pipeline project which will involve the construction of 622 km of underground pipeline linking the existing gas pipelines in the Northern Territory and Queensland. The pipeline will commence approximately 45 kilometres north-east of Tennant Creek near Warrego, and will terminate at its gas Delivery Station adjacent the existing Mount Isa Mica Creek Power Station. Construction of the pipeline will be

performed by a Construction Contractor who will be responsible for implementation of the mitigation measures outlined in this BMP; Jemena will take possession post-construction and will be responsible for mitigation of operational risks to biodiversity.

1.2.1 Construction activities with potential to impact biodiversity

This BMP specifically addresses the following activities associated with construction of the NGP pipeline and ancillary infrastructure that have the potential to cause impacts on biodiversity:

- Clearing, grading, trenching and installing pipeline along the length of the 30 m wide construction Right of Way (ROW) for the entire length of the pipeline.
- Construction and operation of temporary construction camps along the construction ROW.
- Widening of existing, or construction of new, access tracks at designated points to link the construction ROW with public roads.
- Backfilling and reinstating the ROW.

All works listed above will be undertaken within the 'construction footprint'.

1.2.2 Construction schedule

Construction is currently scheduled to commence in early 2017 and the pipeline system is planned to be operational in 2018. The exact timing is dependent on a number of factors including the timeliness of the required approvals, access agreements with relevant stakeholders and weather conditions.

The construction is scheduled to commence in early 2017 and be completed by early 2018 to allow the Construction Contractor to commission the pipeline with gas and commence commercial operation of the NGP pipeline in mid- 2018. Clearing and grading of the construction ROW will commence in early 2017.

1.3 Legislative approvals, permits and licenses

The NGP project falls within the legal jurisdiction of the Commonwealth, Northern Territory and Queensland Governments. Approvals, permits and licences are required pursuant to the legislation within in each jurisdiction as described below.

1.3.1 Pipeline licences

The primary approvals required for construction and operation of the NGP and associated facilities are Pipeline Licences issued pursuant to the Energy Pipelines Act (NT) and the Petroleum and Gas (Production and Safety) Act 2004 (Qld). The issue of Pipeline Licences is conditional upon the NGP project obtaining all environmental approvals required under Commonwealth, Northern Territory and Queensland legislation.

1.3.2 Primary environmental approvals

The NGP project requires environmental assessment and approval pursuant to the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act), Environmental Assessment Act (NT) (EA Act) and Environment Protection Act 1994 (Qld) (EP Act). This BMP is a requirement of the Terms of Reference (ToR) issued pursuant to the EPBC Act and EA Act; the document also provides a framework for compliance with the conditions of Environmental Authority issued under the EP Act for the NGP project in Queensland.

Within the Northern Territory, the approval for the NGP project is under an EIS. The Terms of Reference (TOR) for the EIS provide direction on the requirement for a Construction Biodiversity Management Plan that:

...outlines clear and concise methods to mitigate likely impacts to biodiversity. All mitigation and monitoring measures should be substantiated and in accordance with best practice advice from relevant Northern Territory and Australian Government advisory agencies focusing on:

- potentially significant impacts to the biodiversity as a whole
- mitigating the impacts to vegetation
- rare or threatened species at risk of being adversely impacted
- weed control measures (e.g. prevention and spread of weeds) and hygiene protocols (e.g. wash-down points, weed protocols at the border crossings, etc.) as required under the Weed Management Act.*

** Weed control strategies are detailed in the Weed Management Plan*

In QLD, the Environmental Authority (EA) identifies requirements to minimise risks relating to the management of biodiversity. Such risks include isolation of species, fragmentation and/or degradation of habitat and land clearing. The EA specifically states in E7 that:

Measures to prevent fauna entrapment must be implemented during the construction of pipelines in pipe sections and pipeline trenches and operation of dams.

1.3.3 Biodiversity-related guidelines and permits

Approvals and permits applicable to the management of biodiversity in association with the NGP project are listed below for the Northern Territory and Queensland.

Guidelines and standards

Much of the content of this plan has been derived from the *Code of Environmental Practice for Onshore Pipelines* (APIA 2013).

In the Northern Territory, an application for the clearing of native vegetation must demonstrate, amongst other things, consideration of the *Northern Territory Land Clearing Guidelines*. These guidelines are recognised formally under the *Planning Act*. They require buffering of wetlands and drainage areas, and consideration of sensitive or significant vegetation communities.

Permits

In the Northern Territory, the fauna spotter-catcher (FSC) will be required under the Territory Parks and Wildlife Conservation Act (NT) to hold a *Permit to Take or Interfere with Wildlife*.

In Queensland, the FSC is required to possess a Rehabilitation Permit under the Nature Conservation (Administration) Regulation 2006 (Qld) to capture, release or undertake emergency euthanasia of wildlife.

2 ENVIRONMENTAL MANAGEMENT FRAMEWORK

The NGP project environmental management framework is illustrated in Figure 2-1 below. This BMP forms part of the approvals' phase environmental assessment and management documentation. Implementation will occur through the Jemena and Construction Contractor Environmental Management Systems (EMS).

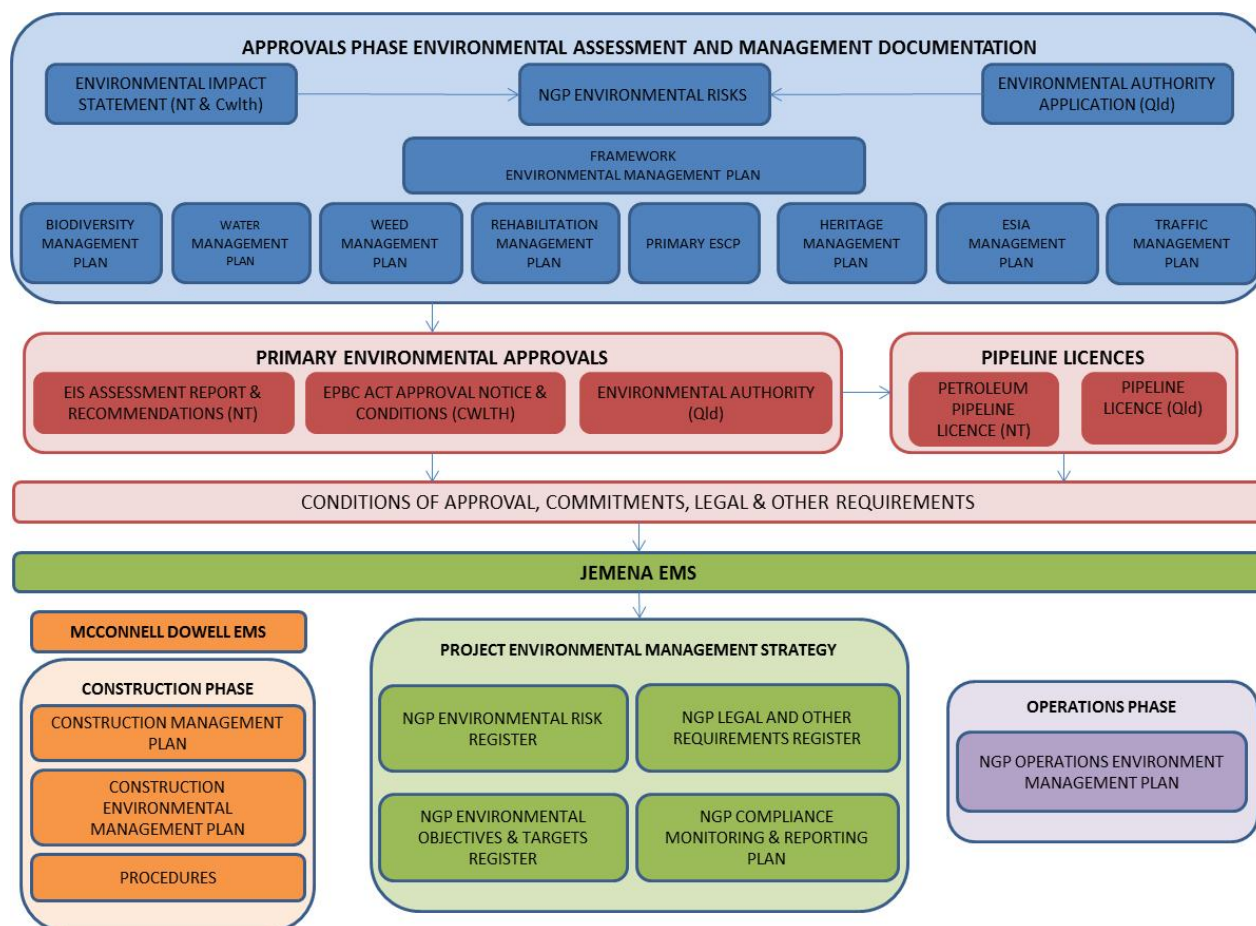


Figure 2-1. NGP project environmental management framework

The Jemena EMS forms part of the company's Health, Safety, Environment and Quality (HSEQ) Strategy. The EMS provides a framework for identifying and managing environmental risks, and for compliance monitoring and reporting. Jemena is responsible for over-arching compliance monitoring and reporting in accordance with the primary environmental approvals and pipeline licences.

During construction, the constructors and any sub-contractors will operate under the Construction Contractor's EMS, which provides the structure and supporting documents for environmental management for all aspects of the Construction Contractor company and projects. The EMS forms part of the Construction Contractor Management System which is accredited to *AS/NZS ISO 9001-2008 – Quality Management System*, *AS/NZS ISO 14001-2004 – Environmental Management System* and *AS/NZS 4801:2001 – Occupational Health and Safety Management System*.

The biodiversity management measures and monitoring programs documented in this BMP will be implemented through the Construction Environmental Management Plan (CEMP) and associated procedures

prepared by Construction Contractor prior to commencement of construction. The CEMP assigns project-specific roles and responsibilities for environmental management and establishes a framework for the provision of environmental induction and training, complaints management and meeting the NGP project internal and external environmental monitoring and reporting requirements.

All Construction Contractor staff and sub-contractors will be inducted prior to commencing works. The induction will include an explanation of the environmental management framework and requirements of management plans, including this BMP.

Operational biodiversity management requirements prescribed through the environmental approvals processes will be implemented through an Operations Environment Management Plan (OEMP) prepared by Jemena. Both the CEMP and OEMP will be consistent and integrated with the Jemena EMS and Construction Contractor EMS.

3 EXISTING ENVIRONMENT

3.1 General biodiversity

Broadly, there are two habitats within the construction footprint – grasslands and open woodland. These are common within the bioregions traversed by the construction footprint and form broad areas of largely contiguous habitat. These habitat types are crossed by ephemeral and intermittent braided streams which provide for areas of riparian vegetation. At the eastern and western ends of the construction footprint there are rocky hills and outcrops which extend over a broad region and are thus not unique to the area of the construction footprint.

There are no conservation reserves intersected by the construction footprint. Camooweal Caves National Park – the closest conservation area to the construction footprint – is located approximately 65 km north of the construction ROW and is adjacent to the Camooweal-Urandangi Road (which may be used to access the construction ROW).

3.2 Sensitive vegetation types

In the Northern Territory, sensitive vegetation types are those considered significant under the *Northern Territory Vegetation Clearing Guidelines* (see Section 1.3.3). These vegetation types are either unique to the region and/or have high biodiversity values. The region of the Northern Territory in which the construction footprint occurs contains one of these sensitive vegetation types – riparian vegetation (there are no wetlands within the construction footprint).

There is some poor quality, riparian vegetation along the Ranken, James, Blue Bush and Georgina Rivers. This is mostly comprised of a few reeds on the bank, some with *Eucalyptus coolabah*. The riparian vegetation in the region is heavily impacted by cattle and weeds.

3.3 Threatened species

Targeted surveys confirmed the presence and/or identified suitable conditions (i.e. potential presence) for five threatened species. Those species were assessed to establish whether local populations are ‘important’ (as defined in *EPBC Significant Impact Guidelines 1.1*) and therefore requiring special attention. As a result, it was concluded in the EIS that important populations of two threatened species are considered to occur, or likely to occur, within the construction footprint:

- Plains Death Adder (*Acanthophsis hawkei*) in the black soil country between KP 355 and KP 561
- Carpentarian Antechinus (*Pseudantechinus mimulus*) in rocky country between KP 609.5 and KP 620.5.

3.4 Existing threatening processes

Fire

Fire mapping indicates that much of the construction footprint was burnt in only 2 or 3 years within the 15-year period between 2003 and 2015. The exception is the black soil country (between KP 355 and KP 561) which experienced no fires, likely due to grazing reducing fuel loads.

Weeds

Twenty-two weed species (declared under the Northern Territory *Weeds Management Act*) have been recorded within the Northern Territory region of the construction footprint. In the Queensland section, twenty-eight weed species (as declared under the *Land Protection (Pest and Stock Route Management) Act 2002*) have been recorded within the region of the construction footprint.

Weed species in the region typically occur within watercourses/alluvial flats, disturbed areas (i.e. roadsides) or heavy clay and/or loam soils. Prior to pipeline construction, the entire route will be surveyed by a botanist and every weed infestation within the construction footprint mapped – see Weed Management Plan for more detail.

Introduced fauna

The following feral species (introduced fauna) are expected to occur within the construction footprint:

- Feral Cat (*Felis catus*)
- Domestic Cattle (*Bos taurus*)
- Feral Horse (*Equus caballus*)
- Feral Camel (*Camelus dromedarius*)
- Feral Pig (*Sus scrofa*)
- Red Fox (*Vulpes vulpes*)

It is unclear to what extent Cane Toad (*Rhinella marina*) occurs within the construction footprint, but it is assumed that species has reached the limits of southerly expansion (as dictated by water availability) in the region (which may or may not include the construction ROW).

Land degradation

Much of the project area is pastoral lease and evidence of cattle impacts is common, especially along drainages and alluvial plains where more palatable grasses (tussocks) and water sources are available. Impacts included grazing, trampling, waterway disturbance and creek bank erosion. Weed species are also significantly more abundant within pastoral tenure compared to non-pastoral tenure.

Some old seismic exploration lines were observed along the construction ROW that showed evidence of significant gully erosion.

4 RISK ASSESSMENT

4.1 Biodiversity

A risk assessment was undertaken for the EIS. That process identified construction activities that have a pre-mitigation risk of impacting biodiversity values. These can be categorised as impacts associated with:

- clearing of vegetation and habitat
- mortality of fauna
 - in the pipeline trench
 - due to vehicle strike
 - due to bushfire
- noise and vibration
- dust
- pollution and waste water
- changes in hydrology
- failure of rehabilitation
- introduction of weeds
- feral fauna.

The purpose of this BMP is to describe the management and mitigation measures that will be undertaken to reduce these impacts to an acceptable level.

4.2 Threatened species

The risk assessment undertaken in the EIS did not identify the need for many mitigation measures specific for any threatened species. As such, species-specific management plans have not been developed. The measures presented in this, and related, management plans are sufficient to minimise the risk to biodiversity generally, and consequently to any threatened species that have a reasonable likelihood of occurring as important populations within the construction footprint. In a few instances, species-specific measures have been developed.

5 BIODIVERSITY MANAGEMENT

As noted in the previous section, project construction activities could impact upon biodiversity values. This section identifies the management actions that will be taken to ensure that this risk is minimised.

5.1 Direct mortality

Direct mortality to native flora and fauna could result from trenching, vehicle strike, blasting and bushfire. Each of these is addressed in turn below.

5.1.1 Vehicle strike

Vehicles will transport personnel, equipment and infrastructure to and from construction areas. Transport will occur on sealed public roads, access tracks and along the construction ROW. Vehicular movements have the potential to strike and kill or injure fauna.

The health and safety requirements for the construction phase will include Safe Work Method Statements (SWMS) governing the safe use of vehicles within the project site, and a Traffic Management Plan. These SWMS will include appropriate speed limits when travelling to and from site and within camps, and reduced vehicle activity at night. The objective of these measures will be, in part, to reduce the risk of a fauna strike, and so will have the effect of minimising the impact on native fauna by vehicle strike.

5.1.2 Trenching

Trenching operations include digging the trench, stringing pipe sections on site, welding sections together, and then installing assembled pipeline into the trench. Fauna have the potential to enter pipe sections, the welded pipeline, or the trench, and become trapped.

Objective: To minimise impact to fauna through entrapment in open trench

Management actions	Monitoring	Performance indicators	Corrective actions
A Trench Inspection Procedure will be developed prior to commencing construction that provides for the presence of qualified fauna spotter-catchers (FSC's) to minimise harm to wildlife during trenching activities by promptly relocating healthy animals, and preventing the suffering of injured animals.	Daily monitoring of trenching operations.	Trench Inspection Procedure is implemented. End caps, plugs, shelters and ladders are installed.	Ensure the Trench Inspection Procedure is implemented (with a review of the procedures if required). The frequency of earth plugs, fauna shelters and/or ladders may be increased at the recommendation of the FSC's.
End caps will be installed on welded pipeline sections at the end of the day's construction activities to stop fauna becoming trapped.			
Trench sections will be inspected each morning by a FSC and any fauna present will be relocated.			
The trench will be progressively backfilled after the pipe is installed.			
Earth plugs will be installed at a maximum of 5 km apart intervals to allow the passage of fauna and stock.			
Earth plugs will be constructed with slopes less than 45° to provide exit ramps for fauna.			
Fauna shelters will be provided at 1 km intervals along open sections of trench to provide shade for any fauna within the trench.			
Recording and	• Trench Inspection Report		

Management actions		Monitoring	Performance indicators	Corrective actions
reporting	• Environmental audit			
Responsibility	• Construction Contractor Environmental Manager – ensure that trench inspections are in accordance with the Trench Inspection Procedure, including direction and supervision of the FSC.			

Carpentarian Antechinus

In the section of the construction ROW proximate to Carpentarian Antechinus habitat (KP 609.5 and KP 622), for every 50 m of rocky habitat and every 100 m of intervening habitat, hessian (or similar material) will be draped from the top of one side of the trench, down along the side and bottom of the trench, and up the other side to the top of the opposite side of the trench. This will allow trapped Carpentarian Antechinus to cross the trench and/or escape the trench.

5.1.3 Blasting

Where the NGP passes through areas of rocky terrain – approximately KP 589 to KP 620 KP – controlled blasting of rock will be required to excavate the trench. Blasting could cause displacement of fauna due to the noise. It may also result in direct mortality or injury of fauna.

The Blasting Operations Management Plan will detail specific management measures for blasting in sensitive areas to protect fauna from displacement or injury caused by blasting operations. Such measures include modification of frequency and timing of blasting activity, and conducting a series of smaller blasts rather than a single, large blast.

5.1.4 Bushfire

Construction works – particularly welding – could generate sparks and cause bushfires. Bushfire has the potential to cause direct mortality to fauna and flora, displacement to fauna, and/or modification to habitat availability or structure.

All construction activities, including establishment and operation of temporary camps, will occur within cleared construction footprints to minimise the risk of ignition sources coming into contact with flammable material such as surrounding vegetation. Any works involving potential ignition sources will have fire prevention and control requirements included in relevant procedures to reduce the risk of bushfires resulting from the works. All vehicles and equipment will be equipped with fire extinguishers and water carts will be located in the proximity of high fire risk activities on high fire danger days. Dedicated smoking areas will be established with butt collection bins utilised. Fire ratings and warnings in the area will be monitored and Jemena and the Construction Contractor will liaise with relevant fire authorities as required.

5.2 Loss of habitat

Clear and grade activities will involve the clearing of vegetation within the construction footprint – this includes a 30 m wide pipeline corridor, construction camps and associated access tracks. Such clearing will lead to a loss of habitat for flora and fauna.

Objective: No native vegetation outside of clearing zone is disturbed

Management actions	Monitoring	Performance indicators	Corrective actions
Clearing will only be undertaken within the specified easement and in accordance with the schedule. Clearing boundaries will be delineated prior to clear and grade activities being undertaken.	Immediately following clearing activities, the area will be checked for any clearing outside	Vegetation outside of the clearing zone is not disturbed.	Review the vegetation-clearing process. Ensure pre-clearing

	of delineated boundary.		meetings are held.
Recording and reporting	<ul style="list-style-type: none"> • Environmental audit • Incident reporting 		
Responsibility	• Construction Contractor Environmental Manager – vegetation clearing inspection and reporting		

Post-construction, reinstatement of all disturbed areas will be undertaken progressively, apart from tracks required for access to permanent facilities or requested to be retained by the landholder or manager. Reinstatement is outlined in the Environmental Management Plan (Chapter 13 of the EIS). Remediation works and weed control will be undertaken as required.

5.3 Reduction in habitat quality

Pollution of waterways, erosion and sedimentation, changes to hydrology, noise, dust and unsuccessful rehabilitation can all lead to reduced habitat quality for biodiversity. Each of these is addressed in turn below.

5.3.1 Pollution and waste water

During the construction of the pipeline, domestic and industrial wastes will be produced – including waste oils, sewage, used lube oils and general refuse. In addition, fuels will be used for machinery, and various cleaning and other industrial products will be used in the day-to-day operations. Water will be primarily required for use at temporary construction camps and for conducting hydrostatic testing of the constructed pipeline. Inappropriately disposed pollutants and wastewater may kill native fauna, and negatively impact vegetation health and structure through direct mortality, or through changes caused by erosion and/or sedimentation.

The Water Management Plan details chemical storage and handling protocol, waste removal and treatment options for wastewater from both camps and the hydrostatic testing. It also describes the wastewater management actions, monitoring, performance indicators and corrective actions, which will minimise the environmental impact of wastewater disposal. The Hydrostatic Test Management Plan sets out procedures for the management and release of hydrostatic test wastewater.

5.3.2 Erosion and sedimentation

Waterway crossings will be constructed. This may lead to erosion and sedimentation, and consequently changed hydrology, with the potential to impact aquatic biodiversity.

The Primary Erosion and Sediment Control Plan (ESCP) provides an erosion risk assessment of the area and stipulates general management and risk minimisation measures for the entire project. Progressive ESCP's will be developed that provide specific detail on high risk areas. This will include (as a minimum), major watercourse crossings, sloped areas that may have dispersive soils, and the compressor stations, where both temporary and permanent controls will be required.

5.3.3 Changes to hydrology

The pipeline will pass through waterbodies along its alignment. Where construction activities intersect with watercourses, riparian vegetation will be removed to facilitate construction across the waterway.

Removal of riparian vegetation has the potential to lead to erosion – increasing turbidity in the waterway – and may also act as an egress for pollutants. This may impact the structure of the riparian and aquatic

environment, leading to a reduction in habitat quality, shelter and food sources. There may also be a reduction in habitat quality due to reduced surface water quality (from pollutants and sedimentation).

The ESCP mentioned in Section 5.3.2 addresses the process for watercourse crossings. The management measures outlined within the ESCP will minimise the impact of construction activities on riparian vegetation. In addition, the Water Management Plan will address management of surface water quality to minimise impact to riparian health.

Water will only be extracted from approved sources that do not support significant biodiversity values.

5.3.4 Noise

Noise will be generated by heavy vehicles engaged in construction works. Noise will be transient and concentrated around rocky areas and construction camps. Blasting is a major noise-generating activity not considered here; it is discussed in Section 5.1.3.

Noise has the potential to displace native fauna species, disrupt breeding cycles and cause disorientation. Because the production of noise will be relatively short-lived, negative impacts should be minimal. Areas subject to higher intensity or prolonged noise (e.g. construction camps) may experience more marked negative impact, but overall this is considered a low risk activity.

The Noise Management Plan details specific measures for reducing impact from noise-generating activities.

5.3.5 Dust

Dust will be generated by vehicle movement, construction works (clearing, grading and trenching) and blasting activities.

Studies on the impacts of dust on plants in a semi-arid environment have generally concluded that short-term dust generation in arid and semi-arid environments does not result in negative impacts on vegetation.

The Air Quality Management Plan details measures for controlling dust emission within the construction footprint – including the use of dust suppression trucks where required.

5.3.6 Unsuccessful reinstatement

Post-construction, rehabilitation will be undertaken within the 30 m pipeline corridor as well as laydown areas, construction camps and access tracks not required for access to permanent facilities or requested by the landowner or manager to be retained.

If rehabilitation is not successful it can lead to invasion from weed species and to erosion. This will lead to a reduction in habitat quality, increased fire risk, and displacement of native flora and fauna.

Post-construction reinstatement of all disturbed areas will be undertaken apart from tracks required for access to permanent facilities or requested to be retained by the landholder. Reinstatement is outlined in the Environmental Management Plan (Chapter 13 of the EIS) and will follow the construction contractor's Reinstatement Management Procedure.

5.4 Introduction or spread of weeds

A 30 m wide corridor will be cleared for the construction of the pipeline. In addition, temporary accommodation camps will also be constructed. Vehicles will move between the camps and construction zone, as well as through the region whilst travelling between the project and nearby towns.

Clearing of native vegetation will increase the risk of weed invasion or spread as the open, disturbed ground is readily colonised and dominated by fast growing weed species. Movement of personnel and vehicles will also increase the likelihood of weed introduction and spread. Proliferation of weed species could lead to

displacement of native vegetation, a reduction in habitat quality, reduction in food sources for fauna, and increased frequency and intensity of bushfires.

The Weed Management Plan includes measures to ensure appropriate hygiene of vehicles, education of personnel (e.g. cleaning boots and equipment between weed infested sites and other areas), active management protocols (e.g. hand pulling, spraying), and protocols for suitable storage of material likely to contain weed seed.

5.5 Introduction or proliferation of introduced fauna

Camps and associated waste stores could attract and feed feral animals. The transportation of goods, vegetation clearing and the general increase in activity may also provide opportunities for introduced fauna to be introduced to, or proliferate in, the region.

Introduced fauna can prey upon, and out-compete, native species for food and habitat, as well as reduce habitat quality. As noted above, introduced fauna species already occur in the construction footprint.

The risk of introduced fauna being introduced to, or proliferating in, the region due to the activities of this project has been identified in the EIS as being inherently low. This is because expected feral species already occur within the region, and activities that could support their proliferation (such as incorrect rubbish disposal) are managed (see, e.g., the Waste Management Plan). Consequently, no specific management measures are proposed, apart from domestic animals being prohibited onsite.

5.6 Threatened species

Impacts to Carpentarian Antechinus will be mitigated through the:

- Implementation of the:
 - Vegetation Clearing Procedure
 - Trench Inspection Procedure
 - Blasting Operations Management Plan
 - Noise Management Plan
 - Dust Management Plan
 - Weed Management Plan
- Installation of end caps, earth plugs and fauna shelters.
- In the section of the construction ROW proximate to Carpentarian Antechinus habitat (KP 609.5 and KP 622), for every 50 m of rocky habitat and every 100 m of intervening habitat, hessian (or similar material) will be draped from the top of one side of the trench, down along the side and bottom of the trench, and up the other side to the top of the opposite side of the trench. This will allow trapped Carpentarian Antechinus to cross the trench and/or escape the trench.

Impacts to Plains Death Adder will be mitigated through the:

- Implementation of the:
 - Vegetation Clearing Procedure
 - Trench Inspection Procedure
 - Dust Management Plan
 - Weed Management Plan
 - Rehabilitation Management Plan.
- Installation of end caps, earth plugs and fauna shelters.

6 MONITORING, RECORDING & REPORTING

6.1 Monitoring

Daily monitoring will be coordinated by the Environmental Manager. In general, daily monitoring of construction activities will be undertaken by on ground personnel, including Construction Contractor inspectors and Jemena inspectors. It is ultimately the responsibility of the Construction Manager to ensure that monitoring in accordance with this management plan is undertaken. Inspections will be completed in the form of checklists.

Jemena will also be performing monthly audits of compliance and effectiveness of this, and other, operational plans.

6.2 Recording & reporting

The Construction Contractor will prepare a weekly report on construction activities. In addition, a number of reports have been identified as part of this BMP to detail compliance with management actions; content and responsibility of these reports are detailed below. Information contained in these reports will be generated as part of regular project monitoring by the construction personnel, and by information provided by the FSC and conducting daily monitoring.

Report	Content	Responsibility
Pre- and Post-clearance Reports associated with the Vegetation Clearing Procedure	<i>To be developed</i>	Construction Contractor Environmental Manager
Fauna Incident Log	Records any animal death or injury due to any construction activity (apart from land clearing and trenching) – e.g. vehicle strike. Records location, time, circumstance of incident and species (if known).	
Trench Inspection Report	For each trench inspection (i.e. daily), records the KP's surveyed, number and species of fauna relocated or deceased, locations in which release occurred, and recommendations (i.e. if more shelters / exit points are required).	

6.3 Incident management

A reportable incident relating to biodiversity is any:

- Animal death or injury due to any construction activity (apart from land clearing and trenching) – e.g. vehicle strike.
- Clearing outside of the specified easement.
- Contravention of a biodiversity-related measure specified in the Federal or Northern Territory approval conditions.

The following information will be included when reporting on such an incident:

- Initial report & notification detailing facts about the incident
- The classification of the nature of the incident (e.g. 'fauna mortality')

- The type of environmental impact
- Whether the incident relates to a contaminant spill or release
- Whether the incident resulted in a regulatory noncompliance or security breach
- Investigation of the incident
- Actions for resolution.

Reportable incidents will be reported as soon as the incident is identified. The Project Manager will be responsible for notification of the incident to the relevant authority where required. Such notification will be undertaken within 48 hours of the incident being reported.

Reportable incidents – such as an animal death or injury – will be documented in the Fauna Incident Log.

7 GLOSSARY, ACRONYMS & ABBREVIATIONS

APGA	Australian Pipeline & Gas Association (formerly APIA)
APIA	Australian Pipeline Industry Association (see APGA)
BMP	Biodiversity Management Plan
CEMP	Construction Environmental Management Plan
DEHP	Department of Environment and Heritage Protection (Queensland)
DLRM	Department of Land and Resource Management (Northern Territory)
DoE	Department of Environment (Commonwealth)
EA	Environmental Authority – an authority issued pursuant to the <i>EP Act</i>
EA Act	<i>Environmental Assessment Act (Northern Territory)</i>
Earth plug	Short section of trench left unexcavated to allow passage of stock or wildlife across the trench
EIS	Environmental Impact Statement
EMS	Environmental Management System
EP Act	Environment Protection Act 1994 (<i>Qld</i>)
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (<i>Cth</i>)
ESCP	Erosion and Sediment Control Plan
FSC	Fauna spotter-catcher – personnel engaged to undertake fauna spotting, trapping and relocation during construction activities.
HSEQ	Health, Safety, Environment and Quality
NGP	Northern Gas Pipeline
NT	Northern Territory
OEMP	Operations Environment Management Plan
SWMS	Safe Work Method Statements
ROW	Right of Way – a 30 m wide area along pipeline route in which construction activities will occur.