NORTHERN NETWORK ALLIANCE

MANAGEMENT PLAN

FAUNA MANAGEMENT PLAN

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Date	Reason for Issue	Revision	Originator	Signature	Checked By	Signature	Approved By	Signature
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INTRODUCTION

This Fauna Management Plan (FMP) is one component of the Construction Environmental Management Plan (CEMP) which provides a system and procedures to ensure that Northern Network Alliance (NNA) establishes and maintains best practice controls to manage potential environmental impacts during the construction of the Northern Pipeline Interconnector (NPI) and associated infrastructure (hereafter referred to as the 'Project') and, wherever practicable, realise opportunities for enhanced environmental outcomes.

The NN Alliance consists of the following partners:

- LinkWater
- Abigroup Contractors Pty Ltd
- McConnell Dowell Constructors (Aust) Pty Ltd
- Kellogg, Brown & Root Pty Ltd

NN Alliance (referred to as the Alliance) is committed to providing the services it offers in a manner that conforms to the contractual requirements and to all relevant regulatory and legislative requirements. To achieve this, the Alliance will plan, implement and control an integrated management system that achieves the stated environmental outcomes.

The Alliance will ensure that controls are properly implemented and regularly monitored and audited to assess their effectiveness. Changes to the controls will be instigated if they are not achieving their objectives.

1.1 Project Description

NPI Stage 2 forms part of the drought contingency pipeline to connect existing and future water infrastructure on the Sunshine Coast with the Brisbane network. The NPI will be constructed in two stages and will allow the transfer of up to 65 ML/d of potable water between the Sunshine Coast and Brisbane. Stage 1 of the NPI project—between Landers Shute water treatment plant (WTP) and Morayfield—is due for completion by 31 December 2008.

The completed NPI (Stage 1 and Stage 2) will supply a target volume of 65 ML/d of potable fresh water to existing facilities at Caboolture for distribution to localities in the greater Brisbane region. NPI Stage 2 will have the capacity to deliver up to 18 ML/d (under existing utilized entitlements for the Noosa Shire).

Subsequent interconnection of Stages of the NPI may be constructed to link with the proposed Traveston Crossing Dam and/or other bulk water sources proposed for the Sunshine Coast. These subsequent Stages are not considered in this report. However, the use of a large diameter pipe capable of transporting bulk water is a basis for the design of both Stages 1 and 2 of the NPI.

The key components of the NPI Stage 2 project are as follows:

- approximately 48 km of underground pipe between Noosa water treatment plant (WTP) and the termination point of NPI Stage 1 at Eudlo;
- a balance tank with a 5 ML capacity;
- three new pump stations; and

- a new water quality management facility (WQMF) and upgrades to an existing WQMF at Landsborough.

A number of additional above-ground facilities would be required for commissioning, operation and maintenance of the system. These include:

- Water quality maintenance structures
- Water branch mains
- Cleaning and communications stations

1.2 Purpose and Scope

Linkwater is committed to conserving and enhancing the biological environment where possible for the duration of the Project while achieving positive environmental, commercial and social outcomes. Accordingly, a Fauna Management Plan has been produced to guide construction activities and post-construction reinstatement.

The purpose of the FMP is to identify measures to mitigate the potential impacts of construction activity on fauna species within the Project area, and to ensure that works are carried out in accordance with the requirements of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, Queensland's *Nature Conservation Act 1992* and *Environmental Protection Act 1994* and other relevant legislation.

It also aims to ensure that the commitments made by the Alliance with regard to fauna management are met.

1.3 Objectives and Targets

Objectives:

- Minimise the impact of construction on native fauna,
- No significant long-term disturbance to fauna outside the required corridor except where deemed unavoidable for construction access

Targets:

- No disturbance to fauna and their habitats outside the required corridor except where deemed unavoidable for construction access
- Safe relocation of 100% of captured fauna within the corridor

The above performance criteria have been developed for this MP to assist to deliver desirable outcomes. The performance criteria will be linked to Key Performance Indicators (KPIs) for the Project.

1.4 Related Management Plans

- The FMP forms part of the overall CEMP for the Project. Where relevant, reference should also be made to the following associated Management Plans:
- Vegetation Management Plan (NNA001-A-PLN-013)
- Weed and Diseases Management Plan (NNA001-A-PLN-016)
- Rehabilitation and Revegetation Management Plan (NNA001-A-PLN-010).

LEGISLATION AND REGULATORY REQUIREMENTS

1.1 Licences/Permits

There are no licences, permits or additional approvals required for the management of fauna related impacts throughout construction.

1.2 Guidelines/References

Key legislation relevant to fauna management includes:

- *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999.*
- *Nature Conservation Act (NCA) 1992*
- *Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016.*

1.3 Commitments

The *Environmental Impact Statement* for the proposed NPI Stage 2 has several commitments for the management of fauna. Table 1 identifies examples of these key commitments.

Table 1. Fauna Management Requirements/Commitments
(refer NNA EIS 2008, Appendix E for final commitments)

Document	Section	Requirement/Commitment
	3.1	Construction sites will be managed to minimise the risk of bushfire to personnel and the environment.
	3.3	Construction will limit and/or avoid impacts on endangered remnant ecosystems.
	3.3	Construction will not adversely affect species of national or state significance.
	3.3	Hollow-bearing roadside and habitat trees will be avoided where possible and/or relocated to suitable areas.
	3.3	Construction in or adjacent to endangered ecological communities or threatened species habitats will be managed through specific mitigation plans.
	3.3	Monitoring of the recovery of impacted ecosystems and/or significant species will be implemented and updated as necessary.

EXISTING ENVIRONMENT

The proposed corridor between Landers Shute heading north to the Noosa WTP and Landers Shute heading west to Image Flat WTP traverses a number of known or potentially significant habitat areas with regional and local corridor and habitat values including:

- rivers, creeks and drainage lines retaining native vegetation
- ridges extending east-west towards the coast
- contiguous areas of vegetation on slopes and flats and in road reserves throughout the project area
- other areas supporting habitat trees (i.e. hollow-bearing or food trees).

Much of the preferred corridor is characterised by heavily disturbed urban and agricultural environments and public utility easements which have been cleared of natural vegetation. However, intact stands of vegetation do persist within and adjacent to the corridor along waterways, ridges and steep slopes traversed by the pipeline. Remnants of the original vegetation do provide foraging and shelter habitat opportunities for a variety of animals and plants, including rare and threatened species.

Despite the highly disturbed nature of the proposed NPI Stage 2 corridor, portions of the study area retain native vegetation and landscape features that provide valuable habitat for a range of fauna species. There are three protected areas within close proximity to the proposed corridor: Ferntree Creek National Park; Wappa State Forest; and Yurol State Forest (NNA EIS 2008).

Assessment of biological features comprised both desktop and field studies to determine the likely impacts on fauna species as well as ecological communities along the proposed route. Desktop records were obtained from the Queensland Museum database, the EPBC Online Protected Matters Database and the Wildlife Online database maintained by the EPA. The data obtained has been provided in Table 2.

Field investigations of the project area were conducted between October 2007 to September 2008, with generally fine still weather conditions and temperatures in the range of 23–30^{o}C.

Methods suitable for identifying the species being targeted included field surveys and habitat assessments involving walk-through assessments of areas with stands of native vegetation. The primary aim of the assessments was to determine:

- the presence of suitable habitat for listed fauna species and the likely presence of listed fauna species
- habitat types/features and integrity
- the local and regional significance of habitats
- habitat connectivity and fauna movement corridors.

Assessments of the habitat attributes were supplemented by opportunistic and dedicated searches for fauna and fauna signs at each site using a range of opportunistic and physical trapping methods.

Further desktop studies, investigation/surveys may be undertaken prior to construction, as required to satisfy this MP.

Table 2. Desktop records of fauna species adjacent to the pipeline alignment

		EPBC		Records				
Taxa	Common name	Status	Habitat	Wildlife Online	Qld Museum	Birds Australia	HERBRECS	Likely occurrence in study area
Birds								
Accipiter novaehollandiae	Grey Goshawk			R				H
Apus pacificus	Fork-tailed Swift	M OM	✓					M
Ardea alba	Great Egret	M OM	✓			✓		H
Ardea ibis	Cattle Egret	M OM	✓			✓		H
Anseranas semipalmata	Magpie Goose	OM	✓			✓		H
Calyptorhynchus lathami	Glossy Black Cockatoo			V				M
Cyclospitta diophthalma coxeni	Coxen's Fig Parrot	E M	✓					M
Erythrotriorchis radiatus	Red Goshawk	V	✓					M
Gallinago hardwickii	Latham's Snipe	M	✓			✓		H
Haliaeetus leucogaster	White-bellied Sea Eagle	M OM	✓			✓		M
Hirundapus caudacutus	White-throated Needletail	M OM	✓		✓	✓		H
Lathamus discolor	Swift Parrot	E	✓	E				L
Lophoictina isura	Square-tailed Kite			R				M
Merops ornatus	Rainbow Bee-eater	M OM	✓		✓	✓		H
Monarcha melanopsis	Black-faced Monarch	M OM	✓		✓	✓		H
Monarcha trivirgatus	Spectacled Monarch	M OM	✓			✓		H
Myiagra cyanoleuca	Satin Flycatcher	M OM	✓					H
Nettapus coromandelianus albipennis	Australian Cotton Pygmy-goose	M OM	✓					M
Ninox strenua	Powerful Owl			V				M
Pezoporus wallicus	Ground Parrot			V	✓			L
Podargus ocellatus plumiferus	Plumed Frogmouth			V	✓			M
Rallus pectoralis	Lewin's Rail			R	✓			M
Rhipidura rufifrons	Rufous Fantail	M OM	✓		✓	✓		H
Rostratula benghalensis australis	Australian Painted Snipe	V M	✓					M
Turnix melanogaster	Black-breasted Button Quail	V	✓	V	✓			M
Tyto tenebricosa	Sooty Owl			R	✓			M
Xanthomyza phrygia	Regent Honeyeater	E M	✓					L
Amphibians								
Adelotus brevis	Tusked Frog			V	✓			H
Assa darlingtoni	Pouched Frog			R	✓			L
Crinia tinnula	Wallum Froglet			V				M
Litoria brevipalmata	Green-thighed Frog			R				M
Litoria freycineti	Wallum Rocketfrog			V	✓			L
Litoria olongburensis	Wallum Sedge Frog	V	✓	V				L
Litoria pearsoniana	Cascade Treefrog			V	✓			L
Mixophyes iteratus	Giant Barred Frog	E	✓	E	✓			H

Rheobatrachus silus	Southern Gastric Brooding Frog			Ex			L
Taudactylus diurnus	Southern Dayfrog	Ex		E			L
Fish							
Maccullochella peelii mariensis	Mary River Cod	E	✓				H
Neoceratodus forsteri	Australian Lungfish	V	✓				H
Maccullochella peelii mariensis	Mary River Cod	E	✓				H
Neoceratodus forsteri	Australian Lungfish	V	✓				H
Pseudomugil mellis	Honey Blue-eye	E	✓				L
Nannoperca oxleyana	Oxleyan Pygmy Perch	E	✓				M
Insects							
Ornithoptera richmondia	Richmond Birdwing Butterfly			V			M
Phyllodes imperialis (southern subspecies)	Pink Underwing Moth	E	✓				M
Reptiles							
Acanthopis antarcticus	Common Death Adder			R	✓		M
Coeranoscincus reticulatus	Three-toed Snake-tooth Skink	V	✓				M
Eroticoscincus graciloides	Elf Skink			R	✓	✓	H
Elusor macrurus	Mary River Tortoise	E	✓				H
Ophioscincus truncatus	Short-limbed Snake-skink			R			M
Ramphotyphlops silvia	Cooloola Blind Snake		✓	R			L
Saproscincus rosei				R	✓		L
Mammals							
Chalinolobus dwyeri	Large-eared Pied Bat	V	✓				M
Dasyurus maculatus maculatus (SE mainland population)	Spotted-tail Quoll	E	✓				M
Phascolarctos cinereus (SE Queensland bioregion)	Koala			V		✓	H
Potorous tridactylus tridactylus (SE mainland)	Long-nosed Potoroo	V	✓			✓	L
Pteropus poliocephalus	Grey-headed Flying Fox	V	✓				M
Plants							
Acacia attenuata	Whipstick Wattle	V	✓				L
Alyxia magnifolia				R		✓	H
Aponogeton elongatus subsp. elongatus						✓	
Baloghia marmorata	Marbled Baloghia	V	✓				L
Bosistoa selwynii	Heart-leaved Bosistoa	V					L
Bosistoa transversa	Three-leaved Bosistoa	V					L
Bulbophyllum globuliforme	Miniature Moss-orchid	V	✓				L
Cryptocarya foetida	Stinking Cryptocarya	V	✓	V			L
Eucalyptus conglomerata	Swamp Stringybark	E	✓				L
Eulophia bicallosa				R		✓	L
Floydia praealta	Possum Nut	V	✓	V		✓	L
Gossia inophloia						✓	L
Graptophyllum reticulatum	Veiny Graptophyllum	E	✓	E			L
Lenwebbia sp. Blackall Range (P.R. Sharpe 5387)				R		✓	L
Macadamia ternifolia	Small-fruited Queensland Nut	V	✓			✓	H
Macadamia tetraphylla	Rough-shelled Macadamia	V	✓				H
Marsdenia hemiptera						✓	

Melaleuca formosa				R		✓	L
Pararistolochia praevenosa				R		✓	M
Parsonsia largiflorer						✓	
Phaius australis	Lesser Swamp-orchid	E	✓	E			L
Plectranthus torrenticola		E	✓	E		✓	M
Pouteria eerwah	Shiny-leaved Condoo	E	✓	E		✓	H
Prasophyllum wallum		V	✓				M
Prostanthera palustris. Bundjalong Nat. Pk/Mt Tinbeerwah	Swamp Mint Bush	V	✓				M
Ricinocarpus speciosus						✓	
Romnalda strobilacea		V	✓	V		✓	L
Symplocos harroldii	Hairy Hazelwood			R		✓	H
Syzygium hodgkinsoniae	Smooth-bark Rose Apple	V	✓			✓	H
Tecomanthe hilii	Fraser Island Creeper			R		✓	L
Thismia rodwayi						✓	
Triunia robusta		E	✓			✓	H
Xanthostemon oppositifolius	Southern Penda	V	✓	V		✓	H
Zieria sp. Brolga Park (A.R. Bean 1002)		E	✓	E			L

E = endangered, C = common, V = vulnerable, R = rare, H = high, L = low, M = medium, B = potential breeding habitat, M = migratory species terrestrial, wetland or marine, OM = may overfly area

A number of significant species have either been confirmed for the study area, or suitable habitat has been recorded and these species are considered likely to occur along the route. Results of the preliminary survey represent likely presence/absence records only and, in some cases, further work will be required to allow species populations to be monitored during and after construction.

Assessment of preferred habitats and ground-truthing of locations along the pipeline corridor established that the proposed works have the potential to impact on these species. Fauna species potentially impacted by the pipeline and associated facilities are summarised below. Detailed assessments for EPBC-listed species are included in the BAAM report (Appendix to the NNA EIS 2008).

The following species are listed as significant under the EPBC and/or the NCA that are either ***known or expected to occur*** in suitable habitat within the study area:

- Giant Barred Frog (*Mixophyes iterates*) – Endangered (EPBC, NCA)
- Tusked Frog (*Adelotus brevis*) – Vulnerable (NCA)
- Wallum Froglet (*Crinia tinnula*) - Vulnerable (NCA)
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – Vulnerable (EPBC)
- Large-eared Pied Bat (*Chalinolobus dwyeri*) – Vulnerable (EPBC); Rare (NCA)
- Koala (*Phascolarctos cinereus*) – Vulnerable (NCA)
- Short-beaked Echidna (*Tachyglossus aculeatus*) – Culturally significant (NCA)
- Spotted-tailed Quoll, SE Mainland (*Dasyurus maculates*) - Endangered (EPBC); Vulnerable (NCA)
- Pink Underwing Moth (*Phyllodes imperialis*) – Endangered (EPBC)

- Australian Fritillary Butterfly (*Argyreus hyberbius incana*) – Endangered (NCA)
- Richmond Birdwing Butterfly (*Ornithoptera richmondia*) - Vulnerable (NCA)
- Common Death Adder (*Acanthophis antarcticus*) - Rare (NCA)
- Elf Skink (*Eroticoscincus graciloides*) - Rare (NCA)
- Short-limbed Snake–skink (*Ophioscincus truncates*) - Rare (NCA)
- Australian Painted Snipe (*Rostratula australis*) – Vulnerable (EPBC; NCA)
- Black-necked Stork (*Ephippiorhynchus asiaticus*) – Rare (NCA)
- Coxen's Fig-Parrot (*Cyclopspitta diophthalma coxeni*) – Endangered (EPBC, NCA)
- Glossy Black-Cockatoo (*Calyptorhynchus lathami*) – Vulnerable (NCA)
- Lewin's Rail (*Rallus pectoralis*) - Rare (NCA)
- Marbled Frogmouth (*Podargus ocellatus plumiferus*) – Vulnerable (NCA)
- Powerful Owl (*Ninox strenua*) – Vulnerable (NCA)
- Red Goshawk, (*Erythrotriochis radiatus*) - Vulnerable (EPBC); Endangered (NCA)
- Red-browed Treecreeper (*Climacteris erythrop*) - Rare (NCA)
- Square-tailed Kite (*Lophoictinia isura*) - Rare (NCA)
- Sooty Owl (*Tyto tenebricosa*) – Rare (NCA)
- Grey Goshawk (*Accipiter novaehollandiae*) – Rare (NCA)
- Square-tailed Kite (*Lophoictinia isura*) - Rare (NCA).

Refer to Appendix 1 of this document for further detail.

3.1 Environmentally Sensitive Areas

Sensitive Area Plans (SAPs) will be developed on a site by site basis and will provide detailed information for individual species as relevant to the project. The SAPs will include information on the specific habitat values that are important to the species, any potential impacts and mitigation measures for each species for both construction and post-construction phases (NNA EIS 2008).

POTENTIAL PROJECT IMPACTS

The impacts on native fauna commonly associated with infrastructure development of the type proposed include the loss or fragmentation of habitat, which may manifest as reductions in food resources, suitable shelter or breeding sites. Linear infrastructure also has the potential to create barriers to movement, preventing mixing of populations or restricting access of individuals to their former habitat.

However, the proposed corridor generally represents a temporary disturbance to habitat areas and will not result in long-term impacts provided that appropriate mitigation strategies are implemented and assessment and monitoring works for particular species are undertaken.

Fauna-specific impacts requiring management include the following:

- clearing may temporarily or permanently limit food foraging habitat (especially for nectivores) and decrease linkages between intact habitats
- refuge and breeding grounds of ground-dwelling animals may be destroyed by clearing and construction works
- vegetation removal may result in direct mortality for individual animals, particularly arboreal species, and temporary barriers to movement during construction
- changes to understorey vegetation and community floristics as a result of greater weed infestation may encourage pest species to colonise an area, or restrict the occurrence of native species previously present
- trenches may act as large pitfall traps for reptiles and small mammals
- fauna mortality may result from increased construction traffic on local roads
- direct loss of aquatic habitat may occur due to trenching activities and increased turbidity due to increased entrained sediment
- food waste/scraps may encourage pest species to enter an area.

ENVIRONMENTAL MITIGATION MEASURES

The following details outline the management measures to be employed to manage potential impacts on fauna relevant to the following categories:

- General activities. Effective communication and the education of all site personnel are key measures for ensuring the mitigation of potential impacts on fauna.
- The employment of fauna monitors in critical habitat areas will decrease the risk of mortality.

5.1 Verification Procedure

The verification procedure is a mechanism to show that the easement has been inspected, all the environmentally sensitive areas are know and delineated, and the construction supervisor has been advised of and acknowledges environmentally sensitive areas. The verification package is a written record and tangible reminder to the construction supervisor that he has environmental obligations ahead of him; and if he doesn't have signoff, then he doesn't have approval to enter that section of the ROW.

In practical terms, the verification procedure is as follows:

- The Environmental Officer reviews the environmental information available for the easement some days ahead of construction.
- The Environmental Officer identifies from the GIS and alignment sheets all those areas that represent an environmentally sensitive area. These areas may include rare or endangered flora, particular water crossings, habitat of rare or endangered animals, heritage areas [Aboriginal or European], and noise sensitive areas.
- The Aboriginal Heritage Officer (refer Aboriginal Cultural Heritage procedures) will locate and tag known aboriginal heritage sites with construction tape and certify that this task is complete within the designated section of ROW. A 50 metre buffer is to be maintained around aboriginal heritage sites. The Contractor will construct a delineation fence to define the buffer zone. There is to be no activity of any sort within this buffer zone.
- The Environmental Officer should inspect the easement and physically identify all other known sensitive areas with construction tape.
- The details of the site; instructions and description of marking should be recorded and noted in the Verification Checklist process.
- If the Environmental Officer is unfamiliar with a particular environmental aspect [e.g. rare animal capture or plant identification] he should call in suitably qualified personnel who can assist. Sufficient time should be allowed to ensure availability of specialist environmental advisers.
- Once all environmental issues have been identified and flagged out on a specified section of ROW, the Environmental Officer shall point out all the issues in that section with the construction supervisor. The construction supervisor will explain what actions will be taken to protect environmental values and that suitable machinery and material (e.g. spill containment kit) is available to protect flagged out areas.

- The Environmental Officer and the Construction Engineer shall sign off on the verification package prior to the commencement of works. Construction can then commence on that section of the ROW described in the general purpose record.

Activity	Management Mitigation Measures	Responsibility	Timing
General	All construction personnel must complete a site induction containing fauna management prior to commencing works on site.	Environmental Manager	Pre-construction
	Periodic toolbox training to be provided to all construction personnel to present new information or reiterate information relating to management of fauna throughout construction.	Environmental Manager	Pre-construction
	Ensure 'no go zones' are clearly sign-posted/ delineated on site prior to the commencement of works.	Environmental Officers	Pre-construction
	Width of construction corridor to be constrained to 15-20 metres when working in areas of 'endangered' vegetation and fauna and, where practicable, within other sensitive areas. Ensure these constrained areas are clearing defined to construction personnel and marked with 'no go' fencing prior to the commencement of works in each area.	Construction Managers/ Environment Manager	At all times throughout construction
Trenching	Erect exclusion fencing on either side of open trenches during times when trenches are unattended overnight or for periods greater than 24 hours. Fencing should be suitable for keeping out large herbivores as well as smaller mammals.	Environmental Officers	As required
	Placing structures such as trench plugs and ramps within open trenches to encourage trapped animals to leave of their own accord.	Environmental Officers	As required
	Where practical and appropriate, provide shade cloth over open trenches to protect trapped animals from extreme temperature and stress until they can be removed.	Environmental Officers	As required
	Monitoring of open trenches and using trained fauna monitors to remove all trapped animals into nearby areas of native vegetation.	Environmental Officers	Daily
Vegetation removal	Carry out all vegetation clearance in accordance with Vegetation and Weed Management Plans.	Environmental Manager / Environmental Officers	Ongoing
	Old growth trees with hollows to be retained wherever possible. Habitat trees to be retained to be clearly marked on site.	Environmental Officers	Pre-construction
	Where habitat trees cannot be retained and are adjacent to areas of bush, the portion of the limb that supports the hollow shall be removed and re-affixed to a nearby tree that will be retained.	Project Ecologist/ Environmental Officers	Pre-construction/ following vegetation clearing
	Replacement of lost hollows with constructed hollows as required.	Environmental Manager	Ongoing
	Disturbance to other structural elements such as fallen tress, logs and other litter in vegetated areas adjacent to the construction corridor to be avoided.	Environmental Officers	Ongoing

Activity	Management Mitigation Measures	Responsibility	Timing
	In line with landowner wishes for his/her timber, retain selected felled trees to replace structural elements.	Environmental Officers	During construction/ post-construction
	Ensure no tree dwelling animals are present in trees to be cleared. In the event of sick, injured or orphaned animals being located during clearing activities, contact the Environmental Protection Authority (EPA) hotline on 1300 130 372.	Environmental Officers	As required
Site access and traffic movements	Construction traffic to be limited to clearly designated areas.	Environmental Officers	Ongoing
	Traffic speeds to be limited when working in potential habitat areas and at dusk and dawn when many species are more active.	Environmental Officers	Ongoing

CORRECTIVE AND PREVENTATIVE ACTIONS

6.1 Community liaison and complaint management

Complaints represent an opportunity to enhance project environmental performance. All project complaints, including those from members of the public, stakeholder groups and Government agencies, will be managed via the 1800 243 998 phone number to be listed in the Inquiry and Complaints Management Procedure, contained in the Community and Stakeholder Management Plan.

Complaints from any source must be registered using the QESE complaint record section. Where the complaint is environment-related, the complaint will be investigated by the Environmental Manager or Environmental Officer in consultation with the Site Manager or delegate and action/s taken to enable satisfactory closure.

Feedback to relevant personnel will be managed by the community relations team. As required, complaint details (including type and preventative/corrective actions) will be advised to field staff via pre-start meetings, toolbox talks or the Health, Safety and Environment Committee as appropriate.

6.2 Environmental incident/emergency reporting

All project staff and subcontractor personnel shall report all environmental incidents to the Environment Team Leader, although initial response may go via the Site Manager/Spread Supervisor or Environmental Officer.

6.3 Incident/emergency preparedness and response

An Incident Response Plan will be prepared for the project. This plan documents suitable incident procedures to ensure effective response in the event of an emergency (including environmental emergencies such as fire, flood and large fuel spills).

The emergency procedures shall be tested on a six-monthly basis. Records are to be maintained of all site emergencies and results of emergency practice drills. The Emergency Response Controller for the project will be defined within the Incident Response Plan.

The key to effective prevention of incidents is monitoring, surveillance and training. During construction activities, inspections and preventative action to be performed by the Alliance will include:

- daily inspections of active worksites and completion of routine environmental checklists
- issue and quick close-out of NCR/EIN
- maintenance of constant supervision on site
- ongoing environmental training
- environmental audits of worksites, subcontractors and compliance issues.

Environmental and safety information on hazardous substances (e.g. Material Safety Data Sheets [MSDS]) will be available at the main site office, including information on where and how such substances are to be stored. An up-to-date list of emergency response personnel and organisations will be maintained at the main office and compounds. A list of key environmental personnel will also be included.

Specific measures will also be implemented to minimise the risk of an incident occurring due to spillage, storage of hazardous materials or fire. Further information will be detailed in the Incident Response Plan.

6.4 Incident investigation

All incidents will be documented, investigations conducted and action plans (if required) developed to ensure no repetition of the event. Where current procedures are identified as being ineffective, the CEMP and any relevant WMS will be revised by the Environmental Manager and/or Health and Safety Manager.

An environmental investigation includes the following basic elements:

- advising the environmental authority(ies) if any substantial pollution has occurred
- identifying the cause and extent of and responsibility for the incident
- identifying and implementing the necessary corrective action
- identifying the personnel responsible for carrying out the corrective action
- implementing or modifying controls necessary to avoid a repeat occurrence of the incident
- recording any changes required to written procedures.

All personnel are required to report all incidents, as incident reporting is regarded as a valuable method of addressing shortcomings in procedures, training or equipment, and is an opportunity for improvement. It is also an offence not to report to the EPA any incident causing serious environmental harm.

6.5 Non-conformances

Non-conformances will be resolved according to the Quality Management Plan. The Environmental Manager or delegate will issue a Non-conformance Report (NCR) or an Environmental Improvement Notice (EIN) in response to inappropriate or non-conforming work methods, equipment selection, maintenance of controls or other identified concern.

In the event of a non-conformance:

- the nature of the event will be investigated by the Environmental Manager
- advice may be sought from a specialist
- monitoring may be undertaken
- the effectiveness or need for new/additional controls will be reviewed
- an appropriate preventative and corrective action will be implemented
- strategies will be identified to prevent reoccurrence
- the NCR will be closed-out
- environmental documentation/WMS will be reviewed and revised
- will be documented on QESE.

INSPECTIONS AND MONITORING

7.1 Inspections

Inspections will be undertaken on a weekly basis to ensure compliance with measures detailed in this FMP. Results of these inspections will be recorded in the Weekly Inspection Checklist (H-FRM-023).

7.2 Monitoring Requirements

In general, the NNA is responsible for monitoring its own and any subcontractor's conformance with the FMP. Key monitoring requirements and responsibilities with respect to fauna management are summarised in Table 3.

Table 3. Monitoring Requirements

Monitoring requirement	Frequency/timing	Performance criteria	Responsibility
Ensuring appropriate facilities are installed in trenches (trench ramps/plugs or branches/bagging)	Daily	All open pipes capped at night and fauna are able to leave trenches of their own accord. Trapped fauna protected from extremes of temperature until they can be removed.	Site Supervisor/ Environmental Officer
Monitoring open trenches for trapped fauna	Daily	All trapped fauna relocated to adjacent areas prior to commencement of works	Environmental Officer/ Fauna monitor
Visual inspection for fauna of areas to be cleared of vegetation	On the day prior to clearing	All visible fauna relocated prior to the commencement of clearing.	Fauna monitor
Habitat trees to be retained are clearly marked prior to clearing	On the day prior to clearing	No hollow-bearing trees off ROW are inadvertently removed from the work site.	Environmental Officer
Hollows from habitat trees to be cleared are removed and re-affixed to trees in adjacent areas or alternative shelter provided	In the week prior to clearing	No net loss of habitat for arboreal fauna	Environmental Officer
Appropriate access and traffic management measures are in place and are complied with	Daily	No fauna mortalities as a result of vehicles	Environmental Officer/Site supervisor
All construction personnel have received appropriate training	Prior to entering work site	Compliance with fauna management measures	Environmental Manager/Construction Manager
Visual inspection of re-established habitat areas	Monthly following reestablishment	Successful rehabilitation of potential fauna habitat.	Environmental Officer

DEFINITIONS AND ACRONYMS

Acronyms	Glossary
CAR	Corrective Action Requests
DEH	Commonwealth Department of Environment and Heritage
DEWHA	Commonwealth Department of Environment, Water, Heritage and Arts
DNRM&W	Department of Natural Resources Mines and Water
EIN	Environmental Improvement Notice
EIR	Environmental Inspection Report
EIS	Environmental Impact Statement (Draft) as prepared by SRWP Co. April 2006
EMP	Construction Environmental Management Plan
EPA	Queensland Government Environment Protection Agency
FMP	Fauna Management Plan
IPA	Integrated Planning Act
KPs	Stands for Kilometre Posts, sometimes referred to as chainage
LinkWater	SRWPCo now trades as Linkwater, which is 100 per cent owned by the Queensland Government
NCR	Non-conformance Report
NNA	Northern Network Alliance
NPI	Northern Pipeline Interconnector
QESE	Quality Environmental Safety Engineering Database
RE	Regional Ecosystem
ROW	Right of way
SEIS	Supplementary Environmental Impact Statement
Sensitive receivers	Inhabitants or occupants of residential or institutional land uses (eg health care and educational facilities)
SCR	Site Communication Record
SRWP Co.	Southern Regional Water Pipeline Company
SWMP	Soil and Water Management Plan (BEG601-A-PLN-038)
VMP	Vegetation Management Plan
WMS	Work Method Statement

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APPENDIX 1

Significant fauna species occurring or potentially occurring in the project area

Species	Status	Habitat and ecology	Occurrence and potential impacts
Giant Barred Frog, *Mixophyes iteratus*	Endangered (EPBC; NCA)	Deep, slow-flowing creeks with overhanging banks in lowland vine forest and riparian gallery forest habitat. Most movements are restricted to within 20 m of the stream. Breeding occurs in spring and summer, often on leaf litter near streams and ponds.	*Potential habitat at South Maroochy River, Sandy Creek, North Maroochy River and north of Neeraway Road* Potential for temporary or permanent loss of suitable breeding sites. Changes in water quality may also adversely impact eggs or tadpoles.
Tusked Frog, *Adelotus brevis*	Vulnerable (NCA)	Slow moving streams and dams in vine forest habitat, particularly around accumulated leaves and small woody debris. Breeding occurs between September and April, when males construct nests in concealed sites at the edge of ponds or stream pools.	*Sandy Creek (confirmed); potential habitat at numerous locations including Eudlo Creek, Tuckers Creek, Rocky Creek, South Maroochy River, North Maroochy River, Six Mile Creek* Potential for temporary or permanent loss of suitable breeding sites. Changes in water quality may also adversely impact eggs or tadpoles.
Wallum Froglet, *Crinia tinnula*	Vulnerable (NCA)	Occurs in 'acid' swamps with a pH 4.3-5.2. The conservation status of this species reflects the loss of suitable acid habitat throughout its range. Breeding occurs in swamps, dams and flooded ditches primarily in autumn but also in late winter, spring and late summer.	*Adjacent to the alignment at Eudlo Creek (confirmed)* Potential for temporary or permanent loss of suitable breeding sites. Changes in water quality may also adversely impact eggs or tadpoles.
Grey-headed Flying-fox, *Pteropus poliocephalus*	Vulnerable (EPBC)	Uses a wide range of habitats for foraging—including rainforests, open eucalypt forests and woodlands. Camping sites are typically within dense vegetation close to water where breeding occurs during the spring months.	*Permanent camp at Cooney Road, Nambour* Potential disturbance during birthing season may cause mortality of young; temporary loss of foraging habitat.
Large-eared Pied Bat, *Chalinolobus dwyeri*	Vulnerable (EPBC); Rare (NCA)	Habitat and roosting requirements of this species are poorly understood. It is thought that it forages for food in a range of vegetation types, including rainforest, open eucalypt forest and on sandstone outcrops. Natural roots may be located predominantly on sandstone outcrops, with disused mine shafts, caves, tree hollows and rock overhangs also recorded as roosting sites.	*Potential habitat at Nobels Road site* Potential loss of roosting sites where hollow-bearing trees are removed.

Table (continued)

Species	Status	Habitat and ecology	Occurrence and potential impacts
Koala, *Phascolarctos cinereus*	Vulnerable (NCA)	Uses a variety of trees for feeding, shelter and breeding purposes but are generally associated with open eucalypt habitat types in Queensland.	*Known habitat south of Diddillibah Road; potential habitat at South Maroochy River*
Short-beaked Echidna, *Tachyglossus aculeatus*	Culturally significant (NCA)	Uses a wide range of habitat types and shelters in logs, crevices, burrows and leaf litter. Mating takes place in July and August with juveniles seen from September.	*Potential habitat at North Maroochy River* Minor, short-term loss of habitat. Minimise disturbance to suitable habitat and have a qualified spotter/catcher present during clearing.
Spotted-tailed Quoll (SE Mainland), *Dasyurus maculatus maculatus*	Endangered (EPBC); Vulnerable (NCA)		
Platypus, *Ornithorhynchus anatinus*	Culturally significant (NCA)	Generally found in stream bank burrows around slow-moving water. Mating season occurs around August in Queensland, with young weaned around 4-5 months after hatching.	*Potential habitat at Eudlo Creek, South Maroochy River, North Maroochy River and Rocky Creek* Potential habitat disturbance when constructing waterway crossings. Conduct pre-start checks for individual animals and minimise disturbance to waterway banks. Implement sediment and erosion controls to maintain water quality.
Pink Underwing Moth, *Phyllodes imperialis*	Endangered (EPBC)	Occurs mainly in thick, lower montane rainforests. Specifically depends on *Carronia multisepalea* in collapsed, shrub-like form as a larval food plant.	*Potential habitat at Nobels Road site* Larval food plant recorded in gullies around the disturbance area; potential for indirect impacts as a result of earthworks (i.e. sediment, erosion, release of pollutants).
Australian Fritillary Butterfly, *Argyreus hyberbius incana*	Endangered (NCA)	Species distribution is dependent on its larval food plant, *Viola betonicifolia*. Preferred habitat consists of open sedge-land, wetlands and swamps in coastal areas.	*Potential habitat at Nobels Road site* Larval food plant recorded in gullies around the disturbance area; potential for indirect impacts as a result of earthworks (i.e. sediment, erosion, release of pollutants).
Richmond Birdwing Butterfly, *Ornithoptera richmondia*	Vulnerable (NCA)	Occurs in subtropical rainforest, littoral rainforest and gallery forest in upland and lowland areas, predominantly on volcanic soils where the larval food plants (*Pararistolochia praevenosa*) grow. Breeding occurs from September to November and February to April. Eggs are also laid on the	*Potential habitat at Ferntree Creek National Park and Nambour area* Species is known from localities adjacent to the proposed alignment; potential for indirect impacts as a result of earthworks (i.e. sediment, erosion, release of pollutants)

Species	Status	Habitat and ecology	Occurrence and potential impacts
		introduced Dutchman's Pipe, *Aristolochia elegans* but the leaves are toxic and kill the larvae.	

Table (continued)

Species	Status	Habitat and ecology	Occurrence and potential impacts
Common Death Adder, *Acanthophis antarcticus*	Rare (NCA)		
Elf Skink, *Eroticoscincus graciloides*	Rare (NCA)	Requires damp leaf litter, logs and stones for shelter and forages in shaded, moist environments. Breeding occurs in spring to mid-summer.	*South of Diddillibah Road (confirmed); potential habitat at Eudlo Creek, South Maroochy River, North Maroochy River and gully near Holts Road* Minor, short-term disturbance to logs and leaf litter layer will have minimal impacts on this species. Replace structural habitat features following construction using available debris.
Short-limbed Snake–skink, *Ophioscincus truncatus*	Rare (NCA)	Known from moist forests of the Blackall Range, inhabiting rainforests and wet sclerophyll forests. Likely to be adversely affected by disturbance to upper layers of soil and leaf litter.	*South of Diddillibah Road (confirmed)* Minor, short-term disturbance to logs and leaf litter layer will have minimal impacts on this species. Replace structural habitat features following construction using available debris.
Australian Painted Snipe, *Rostratula australis* Black-necked Stork, *Ephippiorhynchus asiaticus*	Vulnerable (EPBC; NCA)		
Coxen's Fig-Parrot, *Cyclopspitta diophthalma coxeni*	Endangered (EPBC, NCA)		
Glossy Black-Cockatoo, *Calyptorhynchus lathami*	Vulnerable (NCA)	Requires hollow trees for nesting which generally occurs in trees of the Eucalyptus genera. Preferred foraging trees are	*Potential feed trees at Atkinson Road/Francis Road, Bli Bli* Short-term disturbance to feeding resources where *Allocasuarina* spp.

Species	Status	Habitat and ecology	Occurrence and potential impacts
		She-oaks (*Allocasuarina* spp.), particularly large-fruited plants. Breeding occurs from March to August; with chicks fledging after 60 days. The bird is reliant on suitable hollows in senescent or dead trees for nesting	are removed. Potential removal of nesting sites where hollow-bearing trees removed.
Lewin's Rail, *Rallus pectoralis*	Rare (NCA)		
Marbled Frogmouth, *Podargus ocellatus plumiferus*	Vulnerable (NCA)	Inhabits pockets of closed subtropical rainforests, particularly those with an understorey of palms or ferns. Nests are located mostly on horizontal branches or epiphytic plants.	*Potential habitat at Nobels Road site* No direct disturbance of suitable nesting habitat proposed. The proposed works are unlikely to significantly impact this species.
Powerful Owl, *Ninox strenua*	Vulnerable (NCA)	Wet sclerophyll forest along coasts and hills. Require large tracts of intact forest with hollow-bearing trees to support their prey.	*Potential habitat at Nobels Road site* Potential disturbance to hunting habitats; however, unlikely to significantly impact on this species. Conduct pre-start checks when clearing hollow-bearing trees.
Red Goshawk, *Erythrotriochis radiatus*	Vulnerable (EPBC); Endangered (NCA)		
Red-browed Treecreeper, *Climacteris erythrops*	Rare (NCA)		
Square-tailesd Kite, *Lophoictinia isura*	Rare (NCA)		
Sooty Owl, *Tyto tenebricosa*	Rare (NCA)	Occur in wet eucalypt forests and rainforests where tall emergent trees are present. Territorial species dependent on hollows for nesting.	*Potential habitat at Nobels Road site* No significant impacts are expected for this species or habitat areas. Pre-start checks conducted should include this species.

Table (continued)

Species	Status	Habitat and ecology	Occurrence and potential impacts
Grey Goshawk, *Accipiter novaehollandiae*	Rare (NCA)	Wide-ranging and highly mobile, foraging in rainforest habitats, tall open forests, woodlands, farmland and along timbered watercourses in high rainfall areas. Breeds August to December, nesting in tall trees.	*Likely to use the study area* The proposed action is not likely to result in any significant impact on this species and no specific management measures are required.
Square-tailed Kite, *Lophoictinia isura*	Rare (NCA)	Uses a variety of habitat types, particularly woodlands and forests. Nests are usually located in large trees along watercourses.	*Likely to use the study area* This species is unlikely to be impacted by the proposed action and no specific management measures are required.