

NORTHERN PIPELINE INTERCONNECTOR PROJECT STAGE 2

MANAGEMENT PLAN

Vegetation Management Plan

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Prepared by:

Northern Network Alliance

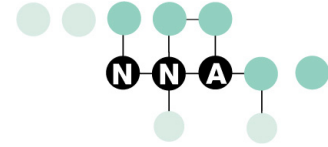
End of Sunridge Farm Road

Chevallum QLD 4555

PO Box 515 Nambour QLD 4560

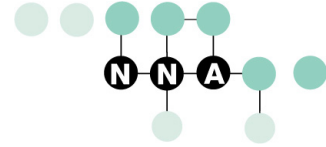
Telephone: (07) 3811 8800

Facsimile: (07) 5456 4203



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1 INTRODUCTION

This Vegetation Management Plan is one component of the Construction Environmental Management Plan (CEMP) (NNA001-A-PLN-017) which provides a system and procedures to ensure that Northern Network Alliance (hereafter referred to as the 'Alliance') establishes and maintains best practice controls to manage potential environmental impacts during the construction of the Northern Pipeline Interconnector (NPI) Stage 2 and associated infrastructure (hereafter referred to as the 'Project') and, wherever practicable, realise opportunities for enhanced environmental outcomes.

The Project is a key component of the SEQ grid. Initially, the Project will transport water under existing utilised entitlement (up to 55% or 3600ML/a has been used by Noosa Shire in the past) authorised under the *Water Resource (Mary Basin) Plan 2006* (Mary Basin WRP). This existing entitlement comprises 6500 ML/a (18 ML/d) interim water allocation (high priority) held by the SEQ Water Grid Manager within the Upper Mary River Water Supply Scheme. However, the pipe will be sized and designed to accommodate flows from future bulk water sources on the Sunshine Coast, including the Traveston Crossing Dam, should it be approved.

The Alliance consists of the following partners:

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

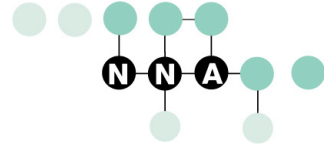
The Alliance is committed to providing the services it offers in a manner that conforms to the contractual requirements and to all relevant regulatory and legislative requirements. To achieve this, the Alliance will plan, implement and control an integrated management system that achieves the stated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

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

The completed Project 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. The Project will have the capacity to deliver up to 18 ML/d (under existing entitlements for the Noosa Shire).



Subsequent interconnection of Stages of the Project 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 Project.

The key components of the Project are as follows:

- approximately 48 km of underground pipe between Noosa water treatment plant (WTP) and the termination point of the Project 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; and
- cleaning and communications stations.

1.2 Purpose and Scope

LinkWater has a commitment to effective environmental management and lists the environment as a key component of its overall vision to become an effective partner in delivering water security to south-east Queensland (LinkWater 2008). LinkWater is committed to adding value to the management of the natural and built environments by adhering to all appropriate local, state and federal environmental guidelines, with an underlying principle of sustainability and positive environmental outcomes (LinkWater 2008).

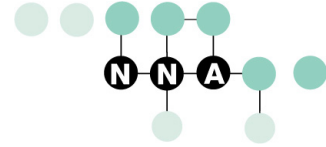
This Vegetation Management Plan (VMP) has been prepared to guide construction activities and subsequent revegetation. The purpose of the VMP is to identify measures to mitigate the potential impacts of construction activity on terrestrial and riparian vegetation.

This Plan will address the requirements of all applicable legislation and aims to ensure that the commitments made by the Alliance within the Project Environmental Impact Statement (EIS) regarding vegetation management and revegetation.

1.3 Related Management Plans

The Vegetation Management Plan forms part of the overall CEMP (*NNA001-A-PLN-017*) for the Project. Where relevant, reference should also be made to the following associated management plans (MPs):

- Weed and Disease Management Plan (*NNA001-A-PLN-017*)
- Fauna Management Plan (*NNA001-A-PLN-007*)
- Revegetation and Rehabilitation Management Plan (*NNA001-A-PLN-010*)



1.4 Objectives and Targets

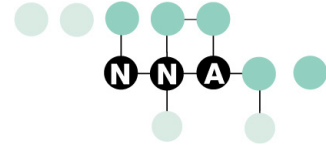
The objectives of this management plan are to:

- Minimise the impact of construction on native vegetation, while ensuring that all works are completed effectively and efficiently.
- Ensure the successful rehabilitation as measured against pre-construction assessment.

The targets associated with this management plan are:

- No disturbance to flora outside the required corridor except where deemed unavoidable for construction access.
- The width of the corridor constrained when working within endangered regional ecosystems and/or habitat for listed threatened flora species.
- Successful rehabilitation and enhancement of disturbed areas within the corridor as measured against pre-construction assessment.

The above performance criteria have been developed for this MP to assist in the delivery of desirable environmental outcomes. The performance criteria will be linked to key performance indicators (KPIs) for the Project.



2 LEGISLATION AND REGULATORY REQUIREMENTS

2.1 Licenses/Permits

The following permits apply to vegetation management for the Project:

- Permit to clear for an ongoing purpose under the Vegetation Management Act 1999 (Department of Natural Resources & Water) (DNRW)
- Riverine Protection Permits (RPP) (DNRW)
- Permit for the taking or destruction of native plants (QPWS).

2.2 Guidelines/References

Key Legislation relevant to this MP includes:

- *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
- *Vegetation Management Act 1999* (Qld)
- *Environmental Protection Act 1994* (Qld)
- *Water Act 2000* (Qld)
- *Nature Conservation Act* (Qld)
- SEQ Regional Vegetation Management Code.

In addition to the above consideration should also be given to the *Land Protection (Pest and Stock Route Management) Act 2002* (Qld), the requirements of which are addressed in the Weed and Disease MP (NNA001-A-PLN-016).

2.3 Commitments

The following commitments are made in the Project EIS and are relevant to this MP. Table 5 lists these commitments.

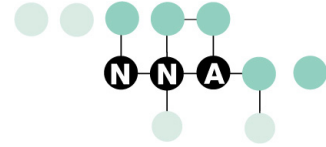
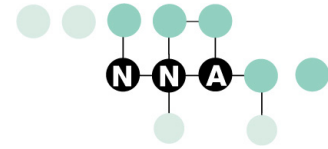


Table 5 Vegetation Management Plan Commitments from the Project EIS

The Project EIS Section (December 2008)	Requirement/Commitment
3.2	Generally the construction corridor will be 30-40 m wide.
3.3	Construction will avoid and/or limit impacts on endangered remnant ecosystems.
3.3	Any required approvals will be obtained for the clearing of remnant and native vegetation.
3.3	Construction will limit and/or avoid impacts on endangered remnant ecosystems.
3.3	Where required, relocation of endangered, vulnerable or rare (EVR) species will be undertaken in accordance with the <i>Guidelines for Translocation of Threatened Plants in Australia</i> (Vallee et al. 2004).
3.3 & 4	Monitoring of the recovery of impacted ecosystems and/or species will be undertaken as required.
3.3 & 4	All sites cleared of vegetation and/or ground cover will be rehabilitates and revegetated with appropriate species including plant species endemic to particular regions.
3.3 & 4	Construction in or adjacent to endangered vegetation communities, sensitive riparian communities, or threatened species habitats will be managed through the implementation of Sensitive Area Plans (SAPs). (NNA001-A-PLN-005) The corridor width will be minimised where possible through these areas.
3.4	Clearing of riparian vegetation will only be undertaken immediately prior to construction, especially at streams with moderate or high ecological values, with reinstatement occurring as soon as possible after completion.
3.4	Construction will use mechanical slashers for clearing work areas in riparian areas where practical rather than bulldozers.
3.4	Reinstatement of riparian vegetation cover will use fast-growing grasses and sedges to stabilise banks with advanced stage planting of riparian tree species to help re-establish canopy cover (with low growing species to prevent hindering powerline operations when in a power easement).
3.13	The proponent will enter into a deed of agreement to provide vegetation offsets where the requirements of the <i>Regional Vegetation Management Code—Southeast Queensland Bioregion</i> cannot be met.



3 EXISTING ENVIRONMENT

3.1 General Description

Preliminary field assessments undertaken by LAMR Pty Ltd in October 2007 and February 2008 were followed up with more detailed assessments at sites of higher environmental significance. Relevant material from the preliminary assessments undertaken by LAMR is addressed in the report 'Assessment of Impacts on Flora'.

EVR flora species likely to occur in the study area were identified by searching the EPBC Online Protected Matters search tool (DEWHA) and Wildlife Online database (EPA). These results were cross-referenced with records held by HERBRECS and the review of RE mapping to define target areas for more detailed field investigation.

The Project area encompasses a variety of landforms which influence regional vegetation patterns. The project traverses the eastern footslopes of the Blackall Range, including a number of ridges which run west-east towards the coast. These vegetated ridges extend through Nambour and Kulangoor, with the remainder of the project area characterised by low elevation ridges, hills and valleys.

The majority of the pipeline route traverses heavily disturbed urban areas, agricultural lands and cleared public utility easements. However, intact stands of vegetation still persist on ridges and steep slopes and along waterways. Areas of remnant vegetation in the study area can be grouped into the following types:

- intact gallery rainforest (RE 12.3.1), sometimes with eucalypt emergents (RE 12.3.2), occurring along waterways
- patches of reasonable size of lowland gallery rainforest now rare within SEQ
- small areas of Melaleuca wetlands in riparian depressions such as those around Eudlo Creek and its tributaries; and
- large areas of tall open eucalypt forests along coastal ridges, often contained within national parks and forest reserves.

Riparian communities are an important feature of vegetation within the pipeline route. While many creeks are degraded inside the easement, most retain sufficient vegetation to act as corridors between intact habitat patches. These narrow corridors also contain important (and frequently unmapped) remnants of the endangered RE 12.3.1, which are often in good to excellent condition despite the pressures imposed by adjacent land uses. These vine forest elements also persist as an understorey to RE 12.3.2, which occurs frequently as unmapped narrow remnants along waterways in the study area.

Table 6 lists the Regional Ecosystem (RE) types present within or adjacent to the proposed The Project pipeline corridor, and lists habitat values and location within the Project area.

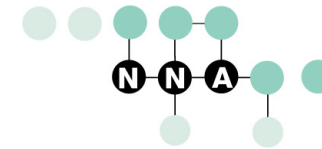
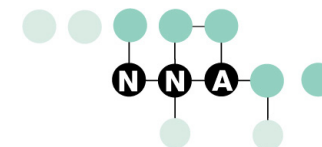
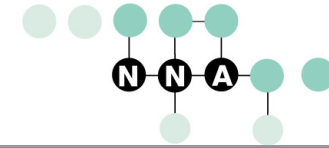


Table 6 Regional Ecosystems Within and Adjacent to the Project Area.

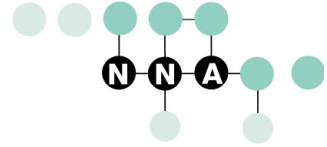
RE type	Status	Description	Comments
12.3.1	Endangered	Complex to simple gallery rainforest (notophyll vine forest) on alluvial plains	Occurs as fringing riparian forest along waterways, with some larger remnants persisting adjacent to the corridor. This RE type typically has a dense canopy and is therefore more sensitive to disturbance than more open forest types encountered in the study area. Clearing of this RE type is also required at waterway crossing locations. EVR flora species recorded from this vegetation type are <i>Phaius tancarvilleae</i> (at Paynter Creek), <i>Symplocos harroldii</i> (at Racehorse Lane) and <i>Xanthostemon oppositifolius</i> (at Six Mile Creek). This RE is also high value habitat for EVR fauna species such as Giant Barred Frog, Tusked Frog and Elf Skink.
12.3.2	Of concern	<i>Eucalyptus grandis</i> tall open forest on alluvial plains	Occurs as small to medium patches in low lying areas around waterways and gullies, often mixed with RE 12.3.1. This RE is high value habitat for EVR fauna species such as Giant Barred Frog, Tusked Frog and Elf Skink. Clearing of this RE type is also required at waterway crossing locations.
12.3.5	Not of concern	<i>Melaleuca quinquenervia</i> tall open forest on coastal alluvial plains	While currently classified as 'not of concern' this RE is likely to fall below the 30% trigger area in 5–10 years. Occurs in depressions around Eudlo Creek, often mixed with RE 12.3.2. Minimal clearing of this RE type is anticipated (< 1 ha).
12.3.6	Not of concern	<i>Melaleuca quinquenervia</i> , <i>Eucalyptus tereticornis</i> , <i>Lophostemon suaveolens</i> woodland on coastal alluvial plains	This RE has a limited distribution in the study area and only occurs adjacent to the corridor near the South Maroochy River and near Eudlo. Minimal clearing of this RE type is anticipated (< 1 ha).
12.3.11	Of concern	<i>Eucalyptus siderophloia</i> , <i>E. tereticornis</i> , <i>Corymbia intermedia</i> open forest on alluvial plains near coast	This RE occurs in small areas around the North and South Maroochy rivers, mixed with RE 12.3.2 on alluvial floodplains. Minimal clearing of this RE type is anticipated (< 1 ha).
12.9-10.1	Of concern	Tall shrubby open forest often with <i>Eucalyptus resinifera</i> , <i>E. grandis</i> , <i>C. intermedia</i> on sedimentary rocks (coastal)	This RE has a limited distribution and only occurs adjacent to the easement near Palmwoods mixed with RE 12.9-10.14. Minimal clearing of this RE type is anticipated (< 1 ha).
12.9-10.14	Not of concern	<i>Eucalyptus pilularis</i> tall open forest on sedimentary rocks	Occurs on slopes between Eudlo and Petrie Creek. Minor clearing is likely to be required along the edges of the easement in steep areas where the corridor needs to be widened to create safe construction



RE type	Status	Description	Comments
			access.
12.9-10.16	Of concern	Araucarian microphyll to notophyll vine forest on sedimentary rocks	This RE only occurs in the study area as a small patch south of Petrie Creek. Minimal clearing of this RE type is anticipated (< 1 ha).
12.9-10.17	Not of concern	Open forest complex often with <i>Eucalyptus acmenoides</i> , <i>E. major</i> , <i>E. siderophloia</i> ± <i>Corymbia citriodora</i> on sedimentary rocks	Occurs on elevated terrain around Eudlo and Cooroy (in Yurol State Forest). Minimal clearing of this RE type is anticipated (< 1 ha).
12.9-10.17d	Not of concern	Open forest generally with <i>Eucalyptus siderophloia</i> & <i>E. propinqua</i> on sedimentary rocks	Occurs in small patches on and adjacent to the corridor at Eudlo and Nambour. Minimal clearing of this RE type is anticipated (< 1 ha).
12.11.2	Not of concern	Tall open forest with vine forest understorey ('wet sclerophyll'). Canopy species include <i>Eucalyptus saligna</i> or <i>E. grandis</i> , <i>E. microcorys</i> , <i>E. acmenoides</i> , <i>Lophostemon confertus</i>	Occurs adjacent to the corridor around Cooroy. The EVR species <i>Alyxia magnifolia</i> was recorded in this RE type. Some clearing may be required to accommodate safe working areas under the existing power line; however, clearing will be restricted to minimise impact on this species/RE type.
12.11.10	Not of concern	Notophyll vine forest ± <i>Araucaria cunninghamii</i> on metamorphics ± interbedded volcanics	Mapped for the study area but not confirmed on or adjacent to the route during field survey.
12.12.2	Not of concern	<i>Eucalyptus pilularis</i> tall open forest on Mesozoic to Proterozoic igneous rocks, especially granite	Mapped for the study area but not confirmed on or adjacent to the route during field survey.
12.12.12	Of concern	<i>Eucalyptus tereticornis</i> , <i>E. crebra</i> or <i>E. siderophloia</i> , <i>Lophostemon suaveolens</i> on granite	Occurs on slopes and ridges around Nambour and Yandina. Some minor clearing may be required along the edges of the cleared power easement but no significant impact is anticipated.
12.12.15	Not of concern	<i>Eucalyptus siderophloia</i> , <i>E. propinqua</i> , <i>E. acmenoides</i> open forest on/near coastal hills on Mesozoic to Proterozoic igneous rocks	Occurs on slopes and ridges at the Ferntree balance tank site as 12.12.15 and forms part of a regional wildlife corridor. This RE type has an open canopy structure and is less sensitive to disturbance than other closed forest types. However, a significant area of clearing (approx. 4 ha) will be required in this RE type to accommodate the proposed balance tank and future infrastructure regardless of its final position.
12.12.15a	Not of concern	<i>Eucalyptus grandis</i> tall open-forest ± vine forest understorey in wet gullies on Mesozoic to Proterozoic igneous rocks	Gully variant of RE 12.12.15 which occurs adjacent to the pipeline corridor within the Ferntree special investigation area. This RE provides suitable habitat for EVR fauna species—Giant Barred Frog, Tusked Frog and Elf Skink. Clearing in this RE type will be

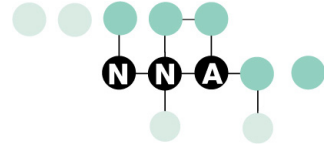


RE type	Status	Description	Comments
			associated with pipeline routes to/from the balance tank; however, the ultimate clearing area will depend on the final location of the preferred corridor.
12.12.16	Not of concern	Notophyll vine forest on Mesozoic to Proterozoic igneous rocks with <i>Araucaria bidwillii</i> , <i>A. cunninghamii</i>	High potential for EVR flora species associated with this RE type. Mapped in gullies at the Ferntree balance tank site but not recorded during field survey. Mapped areas were recorded as gully variants of RE 12.12.15 (12.12.15a).



3.2 Environmentally Sensitive Areas/Features

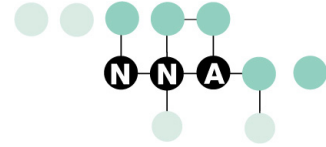
Following the surveys undertaken for the EIS, a number of sites were proposed as ‘Sensitive Areas’; this list of sites is attached at Appendix 1. All of these sites were visited as in preparation for the ‘Sensitive Area Plans’ (NNA001-A-PLN-005). Sensitive Area Plans will be included in the Pre-clearing Verification Package.



4 POTENTIAL IMPACTS

Impacts on vegetation and ecological communities resulting from the construction of the pipeline and associated infrastructure will be primarily associated with vegetation clearance and are common for most species and communities. Potential impacts during the construction period include:

- loss or fragmentation of habitat, resulting in reduced areas of suitable habitat for plant species and reductions in food resources, suitable shelter or breeding sites for fauna
- intensification of edge effects, such as the alteration of micro-climatic conditions which may result in changes of vegetation composition and condition;
- the establishment and spread of weed species
- loss of legislatively significant (rare and threatened) flora and fauna species as a result of these impacts
- damage to legislatively significant ('endangered' and 'of concern') regional ecosystems as a result of these impacts; and
- degraded waterway condition as a result of vegetation clearing within close proximity to waterways.



5 ENVIRONMENTAL MITIGATION MEASURES

5.1 General

The approach adopted by the Alliance to mitigate potential impacts on vegetation is, in the first instance, to avoid areas of environmental significance by locating the pipeline in existing cleared areas. Where this is not possible, further disturbance to significant vegetation will be minimised by employing a constrained corridor of between 15-20 m rather than a full 30 m wide corridor.

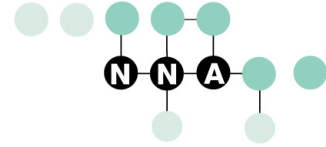
In order to maximise the potential for leaving a positive legacy, the Alliance will reinstate and, where practical, enhance the condition of areas cleared of vegetation for construction works.

5.2 Verification Procedure

The verification procedure is a mechanism to ensure that the easement has been inspected, all the environmentally sensitive areas are known 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/she has environmental obligations ahead of him/her; and if he/she doesn't have signoff, then he/she 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 Sensitive Area Plan (SAP) (NNA001-A-PLN-005) resources 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 receptors.
- The Aboriginal Heritage Officer 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/she 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.

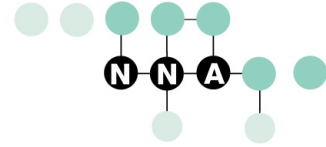
5.3 Management of Construction Activities

Table 7 below outlines the management measures to be employed throughout the construction period to manage potential vegetation impacts relevant to the following categories:

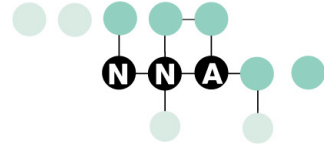
- General activities. Effective communication and the education of all site personnel are key measures for ensuring the mitigation of potential impacts on vegetation.
- Sensitive species and environmental areas. Sensitive species and environmental areas include mapped regional ecosystems, threatened plant species and other communities identified under relevant legislation. Sensitive Area Plans (SAPs) (*NNA001-A-PLN-005*) will be developed for specific environmentally sensitive areas, and for locations where the presence of listed threatened plant (and animal) species is confirmed (see Section 3.2).
- Minimise the construction footprint to reduce vegetation removal.

Table 7 Vegetation Management Strategies

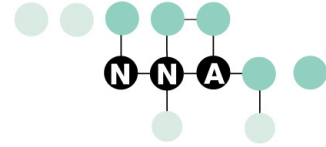
Activity	Management Mitigation Measures	Responsibility	Timing
General	All construction personnel must complete a site induction containing fauna management prior to commencing works on site.	Environmental Manager	Pre-construction
	Periodic toolbox training to be provided to all construction personnel 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
Sensitive Species and Environmental Areas	Develop Sensitive Area Plans (SAP) for critical sections of the ROW containing significant flora and fauna species.	Environment Manager in conjunction with Planning Corridor ecologists.	As required.
	Pre-construction site survey by qualified Environmental Officer to confirm the presence of listed threatened plant species.	Project Botanist/ Site Environmental Officers	Pre-construction
	Document original condition of sensitive communities/species using photographs to inform monitoring and rehabilitation.	Site Environmental Officers/ Planning Corridor ecologists	Pre-construction



Activity	Management Mitigation Measures	Responsibility	Timing
	Use of the Verification Procedure - Areas not to be cleared should be delineated or temporarily fenced off prior to any commencement of clearing works or construction activities.	Supervisor/ Environment Officer	Pre- construction
	Ensure 'no go zones' are clearly sign-posted/ delineated/ fenced on site prior to the commencement of works to identify the boundaries of environmental communities/sensitive species to be protected.	Environmental Officers/ Project Engineers	Pre-construction
	Ensure construction personnel are trained in the meaning of vegetation 'no go zones' and use of the Verification procedure and the consequences of entering 'no go zones'.	Area Managers/ Environmental Manager	Pre-construction/ as required
	Where practical, width of construction corridor to be constrained to 15 metres when working in areas of 'endangered' vegetation and fauna. Ensure these constrained areas are clearly defined to construction personnel and marked with 'no go' fencing prior to the commencement of works in each area.	Construction Managers/ Supervisor/ Environment Officer	At all times throughout construction
	Development of monitoring protocol based on framework monitoring plan included at Appendix 1.	Environmental Manager	Pre-construction
	Undertaking baseline surveys for identified sensitive environmental areas.	Environmental Officers/ Planning Corridor ecologists	Pre and Post construction
Vegetation Removal	Extent of clearing to be clearly identified on design drawings and fencing positioned on site to ensure clearing is minimised.	Design Manager/ Area Managers/ Environment Manager	Pre-construction
	Habitat trees to be identified and marked as required (also refer to the Fauna Management Plan (NNA001- A-PLN-007).	Environment Officers	Pre- construction
	Vegetation shall only be pruned or removed with the prior approval of the Site Environment Officer.	Site Supervisor/ Environment Officers	At all times
	No vegetation clearance is to be undertaken to accommodate access tracks. If conflicting areas or new areas to be cleared are identified ensure that the Environment Manager is notified immediately.	Area Managers/ Site Supervisor	Prior to construction of access tracks and stockpile locations.
Activities around Vegetation	Avoid compaction of soil, especially around the drip zone of mature trees.	Site Supervisor/ Construction personnel	At all times during construction
	Ensure all construction personnel use only designated access tracks when entering or exiting the site.	Environment Officers/ Site Supervisor	At all times during construction



Activity	Management Mitigation Measures	Responsibility	Timing
Materials Handling	<ul style="list-style-type: none"> • Avoid placement of materials around the drip zones of mature trees. • Keep fill material, stockpiles, vehicle parking and access tracks clear of the drip-line of trees and shrubs. • Select areas that are already degraded for site access and storage. 	Site Supervisor/ Construction personnel	At all times during construction



6 CORRECTIVE AND PREVENTATIVE ACTIONS

6.1 Community Liaison and Complaint Management

Refer to Section 8.1 in the Construction Environment Management Plan (CEMP)
(NNA001-A-PLN-017)

6.2 Environmental Incident/Emergency Reporting

Refer to Section 8.2 in the Construction Environment Management Plan (CEMP)
(NNA001-A-PLN-017)

6.3 Incident/Emergency Preparedness and Response

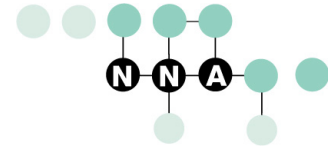
Refer to Section 8.2 in the Construction Environment Management Plan (CEMP)
(NNA001-A-PLN-017)

6.4 Incident Investigation

Refer to Section 8.2 in the Construction Environment Management Plan (CEMP)
(NNA001-A-PLN-017)

6.5 Non-conformances

Refer to Section 8.2 in the Construction Environment Management Plan (CEMP)
(NNA001-A-PLN-017)



7 INSPECTION AND MONITORING

7.1 Inspections

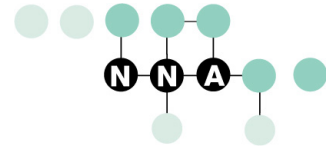
Inspections will be undertaken on a weekly basis to ensure compliance with the measures detailed in this VMP. Results of these inspections will be recorded in the Weekly Inspection Checklist (*Form G-FRM-001*).

7.2 Monitoring Requirements

In general, the Alliance is responsible for monitoring its own and any subcontractor's conformance with the VMP. Key monitoring requirements and responsibilities with respect to vegetation management are summarised in **Table 8**.

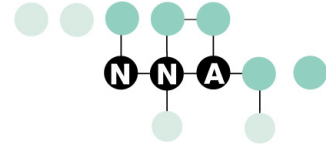
Table 8 Monitoring Requirements

Monitoring requirement	Frequency/timing	Performance criteria	Responsibility
Field survey for listed species	Pre-construction	Minimal loss of significant species through clearing or construction	(Corridor) Environment Teams
Documenting original condition of vegetation to be cleared through Sensitive Area Plans	Pre-construction	Adequate benchmark for reinstatement	(Corridor) Environment Team
Review Sensitive Area Plans for site specific requirements	Pre-construction planning	Successful implementation of mitigation measures in sensitive environmental areas	Environment Officer
Relocation of any significant species within pipeline alignment	In the week prior to construction or as appropriate	No loss of significant species populations	Environment Officer
Implement restricted width corridor as required	Pre-construction planning	No unnecessary clearing of vegetation	Environment Officer
Fence off areas around environmental communities/species	On the day (or prior to) clearing in accordance with the verification procedure	No damage to existing significant species or communities	Environment Officer
Appropriate access and traffic management are in place and are complied with	Prior to commencing works on site	No damage to native vegetation or compaction of soil around trees	Environment Officer
Visual inspection of re-established habitat areas	Monthly following reestablishment	Successful reinstatement in accordance with revegetation plan	Environment Officer



8 DEFINITIONS AND ACRONYMS

Acronym	Glossary
Aust	Australia
CEMP	Construction Environmental Management Plan
DEWHA	Federal Government Department of Environment, Water, Heritage and the Arts
DNRW	Queensland Government Department of Natural Resources and Water
EIN	Environmental Improvement Notice
EIS	Environmental Impact Statement
EPA	Queensland Government Environmental Protection Agency
EVR	Endangered, vulnerable or rare (species listed under state and federal legislation)
GIS	Geographical Information System
KPI	Key Performance Indicator
LinkWater	SRWPCo now trading as LinkWater and is 100 per cent owned by the Queensland Government
Mary Basin WRP	<i>Water Resource (Mary Basin) Water Resource Plan 2006</i>
ML	Megalitre (equivalent to 1 million litres)
ML/d	Megalitres per day
MP	Management Plan
MSDS	Material Safety Data Sheet
NCR	Non-conformance Report
NNA	Northern Network Alliance
NPI	Northern Pipeline Interconnector
QESE	Quality Environmental Safety Engineering database
QPWS	Queensland Parks and Wildlife Service
RE	Regional Ecosystems
ROW	Right of Way
RRP	Riverine Protection Permit (Department of Natural Resources and Water)
SAP	Sensitive Area Plan
SEQ	South-east Queensland
VC	Verification Checklist
VMA	<i>Vegetation Management Act 1999</i>
VMP	Vegetation Management Plan
WMS	Work Method Statement
WQMF	Water Quality Management Facility
WRP	Water Resource Plan
WTP	Water Treatment Plant



9 REFERENCE DOCUMENTS

Construction Environmental Management Plan (*NNA001-A-PLN-017*)

DNR&W, 2006. Interim Policy for Vegetation Management Offsets, Department of Natural Resources, and Water, 2006.

Environment Protection and Biodiversity Conservation Act 1999 (Cwth)

Environmental Protection Act 1994 (Qld)

Fauna Management Plan (*NAA001-A-PLN-007*)

Land Protection (Pest and Stock Route Management) Act 2002 (Qld)

LinkWater 2008, *Environment*, accessed 6 February 2009

< <http://www.linkwater.com.au/index.php?id=79>>

Natural Assets Local Law 2003

Nature Conservation Act 1992 (Qld)

Northern Network Alliance 2008, *LinkWater Projects: Northern Pipeline Interconnector - Stage 2 Environmental Impact Statement*, released 17 January 2009.

NRM&E 2004. Regional Vegetation Management Code for Ongoing Clearing Purposes in the South-East Queensland Region, Department of Natural Resources, Mines and Energy.

Quality Assurance Management Plan (*NNA0010A-PLN-037*)

Revegetation and Rehabilitation Management Plan (*NNA001-A-PLN-010*)

Sensitive Area Plan (*NNA001-A-PLN-005*)

SRWPA 2006a, Northern Pipeline Interconnector Draft Environmental Impact Statement (EIS), Southern Regional Water Pipeline Alliance, Queensland.

State Development & Public Works Organisation Act 1971 (Qld)

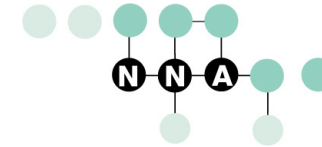
Vallee, L, Hogbin, T, Monks, L, Makinson, B, Matthes, M & Rossetto, M 2004, *Guidelines for the translocation of threatened plants in Australia*, 2nd edn, Australian Network for Plant Conservation, Canberra.

Vegetation Management Act 1999 (Qld)

Vegetation Management Plan (*NNA001-A-PLN-013*)

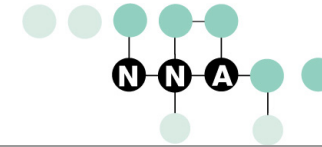
Water Act 2000 (Qld)

Weed and Disease Management Plan (*NNA001-A-PLN-016*)

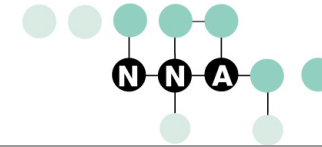


APPENDIX 1

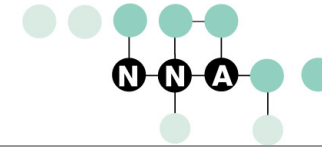
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
300	300-North Nobels Road-01	6RP909418	30001	0 - 0.4 km	North of Nobels Road, Eudlo	State	Potential habitat for the Pink-Underwing moth in gullies to the south and potential habitat throughout area for Large-eared Pied Bat.		Potential habitat throughout area for Large-eared Pied Bat.		Wildlife corridor of State significance.
300	300-North Nobels Road-02	5SP101373	30002	0.5km							



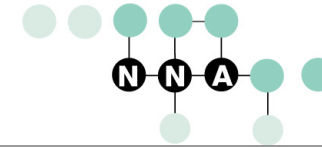
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
300	300-North Nobels Road-02	4RP807488	30008	0.9km							
300	300-South Slaughter Yard Road waterway-01	1RP170287	30020	2.0 km	Waterway to the south of Slaughter Yard Road, Eudlo			RE 12.3.2			Waterway has local wildlife corridor values.
300	300-North Slaughter Yard Road waterway-01	3RP154277	30025	2.75 km	Waterway to the north of Slaughter Yard Road, Eudlo						Waterway has local wildlife corridor values. Riparian vegetation - non-remnant RE 12.3.1/12.3.2



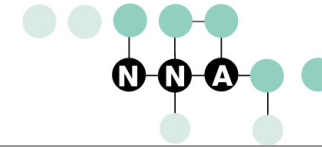
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
300-301	300/01-McGilchrist Road veg-01	3RP171034, 6RP810281, 5SP121792, 4RP884062, 10RP224865, 7RP217592	30031, 30032, 30034, 30035, 30036, 30101	3.5 - 5.0 km	Remnant vegetation within easement between McGilchrist and Chevallum Roads, Chevallum	Regional, State		12.3.1/12.3.2/12.3.5			
301	301-Gully Winston Road South-01	1RP28013, 1RP91344, 22RP887960	31104, 31105, 31106	5.5 - 6.0 km	Slope and gully south of Winston Road South, Woombye	State and Local		RE 12.3.2	Potential habitat for Tusked Frog and Koala.		Local east-west wildlife corridor.
301	301-Drainage north Winston Road-01	2RP69424, 1RP69424	31113, 31114	6.5 km	Drainage line north of Winston Road, Woombye			RE 12.3.1	Tusked Frog present. Potential habitat for Elf Skink.		Local wildlife corridor.



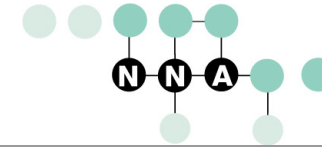
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
301	301-Drainage north Winston Road-02	5SP130323	31117	7.0 km	Drainage line north of Winston Road, Woombye			RE 12.3.2	Potential habitat for Tusked Frog and Elf Skink.		
301	301-Gully south Nambour Connection Road-01	9SP110884, 8SP172908, 1RP109849	31121, 31122, 31123	8.0 km	Gully south of Nambour Connection Road, Woombye				Tusked Frog present and potential habitat for Koala & Lewin's Rail.		Local east-west wildlife corridor
301	Gully south Nambour Connection Road-01	5SP156934	31128								



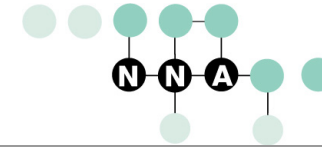
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
301	301-Paynters Creek Crossing-01 and 02	1SP147228, 12RP196988	31135, 31136	10.0 - 10.25 km	Paynters Creek— Crossing 1 & 2	State	Potential habitat for Giant Barred Frog.	RE 12.3.2	Potential habitat for Giant Barred Frog and Elf Skink.		Local east-west wildlife corridor
301	301-East of Paynters Creek Northern Crossing-01	4RP195810, 6RP28178 (may need access via 2RP836638)	31137, 31139 (may need access via 31140)	11.25 - 11.5 km	Paynters Creek— Northern crossing	Local		RE 12.3.1	Potential habitat for Giant Barred Frog.		
302	302-Petrie Creek Crossing-01	6RP220222	31168	14.0 km	Petrie Creek Crossing	State	Potential habitat for Giant Barred Frog.	Degraded RE 12.3.1/12.3.2.	Elf Skink present. Potential habitat for Tusked Frog.		Local wildlife corridor.



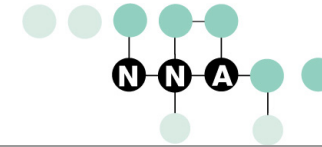
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
302	302-Tuckers Creek Crossing-01	12RP94474	30330	15.0 km	Tuckers Creek crossing behind Maroochy Shire Council Depot, Nambour		Potential habitat for Giant Barred Frog.		Potential habitat for Giant Barred Frog, Tusked Frog and Elf Skink.		Riparian vegetation
302	302-Vegetation north of Tuckers Creek-01	135NPW672	30332	15.0 - 15.5 km	Vegetation north of, and running parallel to, Tuckers Creek, Nambour (Road reserve along southern boundary of Ferntree Creek National Park)			RE 12.3.1 (check if cleared)	Potential habitat for Tusked Frog and Elf Skink.		



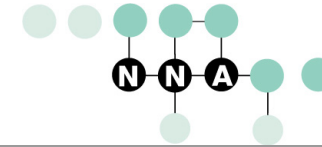
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
302	302-Dams at end of Tuckers Creek Road-01	8RP886266	30359	16.25 km	Dams either side of easement at the end of Tuckers Creek Road, Nambour			RE 12.3.2 (check if cleared within easement)	Potential habitat for Tusked Frog and Elf Skink.		
302-304	302/304-Tuckers Creek Tributary-01	10RP230796, 2RP206847	30365, 31002	17.0 - 17.75 km	Significant RE 12.3.2 vegetation along Tuckers Creek tributary to the immediate west of the existing easement, RE 12.3.1/12.3.2 regrowth adjacent to crossing location		Potential for Giant Barred Frog.	RE 12.3.2	Potential for Elf Skink and O. truncatus, Tusked Frog, Koala, Green-thighed Frog and Giant Barred Frog.		



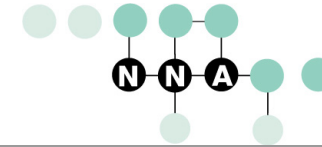
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
304	304-Ferntree Creek National Park-01	12SP201521, 10SP201521, 9SP201521	31009, 31010, 31011	17.75-18.25		Local					
304	304-Rocky Creek-01	4RP207955, 3RP178889	31013, 31014	19.8 km	Rocky Creek (also called Caboolture Creek in some reports)				Tusked Frog present and potential habitat for Koala.		
304	304-Open forest woodland adjacent to Mt Crombe Road - 01	4RP207955, 3RP178889	31019, 31017, 31015	20.3 km	Open forest woodland to the north, adjacent to Mt Combe Road			RE 12.12.12	Tusked Frog present and potential habitat for Koala.		



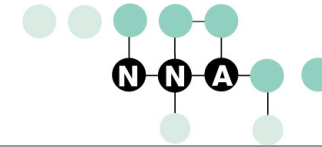
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
304-305	304/305-Tributaries of South Maroochy River-01	700SP171080	30503	21.5 km	Tributaries of South Maroochy River						Narrow corridor for local movement with north-south linkages.
305	305-South Maroochy River (including Mount Combe Creek)-01	2SP137831, 261C311580	30504, 30507	22.0 km	South Maroochy River (including Mount Combe Creek)		Potential habitat for Giant Barred Frog.	RE 12.3.1	Potential habitat for Giant Barred Frog, Tusked Frog, Elf Skink, Platypus and Koala.		
305	305-Tributary of the North Maroochy River-01	937C311485	30546	23.5 km	Tributary of the North Maroochy River						Local wildlife corridor with east-west linkages.



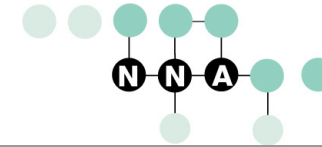
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
305	305-Browns Creek-01	2CG6223	30555, 30559	25.5 km	Browns Creek at Lees Road			RE 12.3.1			Local wildlife corridor.
305	305-Tributary of the North Maroochy River-02	2RP906929	30561	26 km	Tributary of the North Maroochy River						Local wildlife corridor.
305	305-Running Creek-01	21SP124797	30567	26.5 km	Running Creek			RE 12.3.1			State wildlife corridor.
306	306-Gold Creek-01	2SP127417, 3SP116472	30611, 30612	29.5 km	Gold Creek			RE 12.3.2/12.3.1			
306	306-Balsam Road-01	N/A Road Reserve	N/A Road Reserve	31.0 - 31.5 km	Balsam Road	State		RE 12.9-10.14/12.9-10.1			



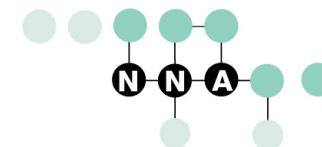
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
307	307-Dam and vegetation to west of Bruce Highway-01	N/A Road Reserve	N/A Road Reserve	32 km	Dam and vegetation to the west of the Bruce Highway, Eumundi	Regional		?			
307	307-Vegetation to the west of Bruce Highway-01	N/A Road Reserve	N/A Road Reserve	32.5 - 33 km	Vegetation to the west of the Bruce Highway			RE 12.9-10.14/12.3.2 (from botanist -mapped as RE 12.12.12)			Regionally significant wildlife corridor
307	307-Sandy Creek-01	N/A Road Reserve	N/A Road Reserve	33.25 km	Sandy Creek			RE 12.3.1	Potential habitat for Tusked Frog, potential habitat for Giant Barred Frog.		Regional wildlife corridor.



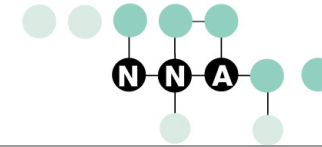
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
307	307-North Maroochy River-01	N/A Road Reserve	N/A Road Reserve	34.75 km	North Maroochy River		Potential habitat for Giant Barred Frog.	RE 12.3.1	Potential habitat for Giant Barred Frog, Tusked Frog, Elf Skink, Platypus and Echidna.		Local wildlife corridor.
307	307-Vegetation north of Neeraway Road-01	N/A Road Reserve	N/A Road Reserve	35.0 km	Vegetation north of Neeraway Road		Potential habitat for Giant Barred Frog.		Potential habitat for Giant Barred Frog and Tusked Frog.		
307	307-Vegetation within corridor-01	2SP127433	30720	36.0 km	Vegetation within corridor	Regional	Potential habitat for Giant Barred Frog	RE 12.3.11/12.3.2	Potential habitat for Tusked Frog and Giant Barred Frog.		



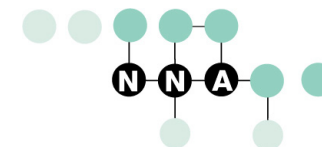
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
308	308-Gully at Holts Road-01	2RP208569	30801	37.0 - 37.25 km	Gully at Holts Road	State		RE 12.9-10.16	Potential habitat for Elf Skink.		Regional wildlife corridor.
308	308-Unnamed waterways-01	2RP894887	30817	39.5 km	Unnamed waterways	State		RE 12.3.1/12.3.2	Potential for Tusked Frog and Koala		Regional wildlife corridor.
308	308-South of Tewantin Road-01	2SP105441	30821	40.0 km	South of Tewantin Road, Cooroy	Local			Alyxia magnifolia present.		
308	308-Pearsons Road Drainage-01	100SP112631, 3RP215922, 3RP169814	30903, 30930, 30931	41.5 km	Pearsons Road, drainage reserve, Cooroy	Local	Xanthostemon oppositifolius	RE 12.3.2/12.3.1	Symplocos harroldii		



Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
308	308-Six Mile Creek (left branch) close to Lamonts Road-01	11SP161946, 10SP161946, 2RP174721	30932, 30933, 30934	42.6 km	Six Mile Creek (left branch) close to Lamonts Road	Local	Potential for Xanthostemon oppositifolius, Oxleyan Pygmy Perch and Mary River Turtle.	RE 12.3.2/12.3.1	Oxleyan Pygmy Perch and Tusked Frog.		
309	309-Kennedys Road-01	2RP174721, 952FTY1672		43.5 - 44.5 km	Kennedys Road	Regional and Local		RE 12.3.2, 12.9-10.1/12.9-10.17			



Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
309	309-Kennedys Road-02	112MCH793, 3SP108094	30936, 30942, 30944	45.5 - 46.5 km	Easement off Kennedys Road to Six Mile Creek (left branch) and anabranh	State	Xanthostemon oppositifolius present. Potential for Mary River Turtle Mary River Cod and Oxleyan Pygmy Perch.		Tusked Frog present. Potential for Oxleyan Pygmy Perch.		State wildlife corridor.



Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
309	309-Six Mile Creek main channel-01	118MCH814	30922	47.5 km	Six Mile Creek main channel (downstream of dam wall) crossing		Mary River Cod present. Potential habitat for Lungfish and Mary River Turtle; Xanthostemon oppositifolius in copse next to park.				