COMPLIANCE TRACKING PROGRAM

Woolgoolga to Ballina – Stage 1

Woolgoolga to Halfway Creek Section 1

6 Monthly Compliance Report

MAY TO NOVEMBER 2016

Document control

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Report name	Woolgoolga to Ballina Stage 1 Compliance Tracking Program W2HC 3rd Six Months Compliance Report
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Revision history

Revision	Date	Description	Approval
0	30/4/15	Woolgoolga to Ballina Stage 1 Compliance Tracking Program	
1	19/5/15	Woolgoolga to Ballina Stage 1 – W2HC Pre-Construction Compliance Report	
2	7/7/15	Woolgoolga to Ballina Stage 1 – W2HC Pre-Construction Compliance Report [Updated to address Dept of Planning comments]	
3	19/2/16	Woolgoolga to Ballina Stage 1 – W2HC 1st 6 Monthly Compliance Report	
4	18/7/16	Woolgoolga to Ballina Stage 1 – W2HC 1st 6 Monthly Compliance Report post Department of Planning Comments	
5	6/9/16	Woolgoolga to Ballina Stage 1 – W2HC 2nd 6 Monthly Compliance Report	
6	10/02/17	Woolgoolga to Ballina Stage 1 – W2HC 3rd 6 Monthly Compliance Report	

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Glossary / Abbreviations

ASS	Acid sulphate soils
CEMP	Construction environmental management plan
Compliance audit	Verification of how implementation is proceeding with respect to a construction environmental management plan (CEMP) (which incorporates the relevant approval conditions).
CoA	Conditions of approval
DP&E	Department of Planning and Environment
EA	Environmental Assessment
Ecological sustainable development	Using, conserving and enhancing the community's resources so that the ecological processes on which life depends are maintained and the total quality of life now and in the future, can be increased (Council of Australian Governments, 1992).
EPA	NSW Environment Protection Authority
ERG	Environmental Review Group – comprising representatives of RMS, Environmental Representative, Project delivery team, regulatory authorities (EPA, DPI – Fisheries Conservation and Aquaculture, NOW) and councils (Coffs Harbour City Council, Clarence Valley Shire Council). The ERG will be maintained for the duration of the Project and will meet regularly and undertake environmental inspections. The role the ERG is to provide proactive advice on environmental management issues and review the environmental performance of the Project.
EMM	Environmental Management Measures
EMS	Environmental management system
Environmental aspect	Defined by AS/NZS ISO 14001:2004 as an element of an organisation's activities, products or services that can interact with the environment.
Environmental impact	Defined by AS/NZS ISO 14001:2004 as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects.
Environmental incident	An unexpected event that has, or has the potential to, cause harm to the environment and requires some action to minimise the impact or restore the environment.
Environmental objective	Defined by AS/NZS ISO 14001:2004 as an overall environmental goal, consistent with the environmental policy, that an organisation sets itself to achieve.
Environmental policy	Statement by an organisation of its intention and principles for environmental performance.
Environmental target	Defined by AS/NZS ISO 14001:2004 as a detailed performance requirement, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.
Environmental Representative	A suitably qualified and experienced person independent of project design and construction personnel employed for the duration of construction. The principal point of advice in relation to all questions and complaints concerning environmental performance.
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPL	Environment Protection Licence

Minister, the	Minister for Planning
Non-compliance	Failure to comply with the requirements of the Project approval or any applicable license, permit or legal requirements.
Non-conformance	Failure to conform to the requirements of Project system documentation including this CEMP or supporting documentation.
NOW	NSW Office of Water
OEH	Office of Environment and Heritage
Project, the	The Woolgoolga to Ballina Project
RMS	Roads and Maritime Services
Secretary	Secretary of the NSW Department of Planning and Environment *(or delegate)*
Stage 1 of the Woolgoolga to Ballina Upgrade	Section 1 – Woolgoolga to Halfway Creek Section 2 – Halfway Creek to Glenugie Wave 1- Soft soils works at Harwood Wave 2- Soft soils works at Whytes Road to Pimlico Wave 3- Soft soils works between Tyndale and Iluka Road and at Tuckombil Canal, Woodburn

1. Introduction

1.1 Project description

NSW Roads and Maritime Services is upgrading the Pacific Highway between Woolgoolga and Ballina on the NSW North Coast. This is known as the Woolgoolga to Ballina Pacific Highway upgrade project. An overview of the project is shown in Figure 1-1.

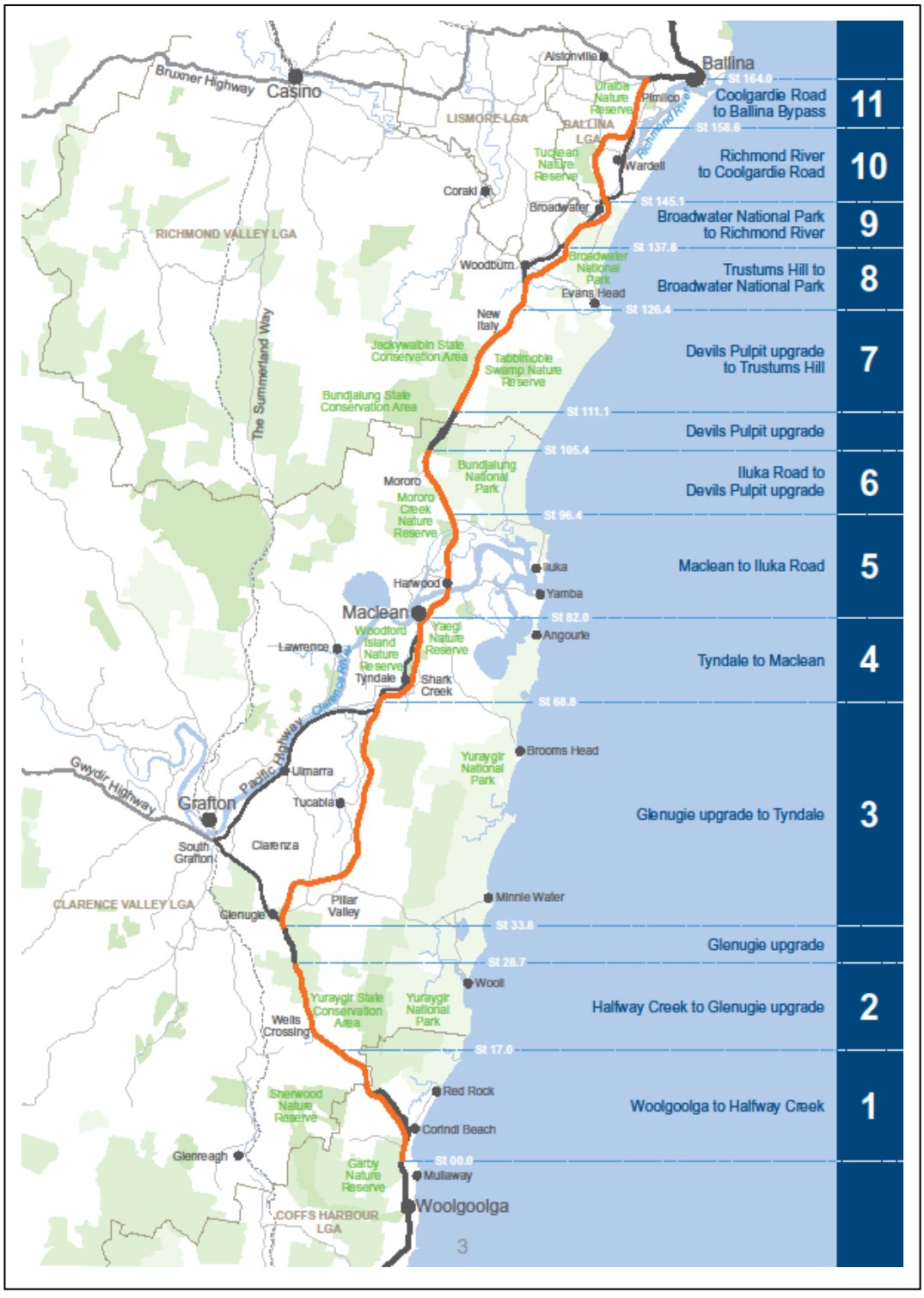


Figure 1-1 Woolgoolga to Ballina Pacific Highway Upgrade

The project would upgrade around 155 kilometres of highway and represents the last priority (known as 'Priority 3' in the upgrade program) in achieving a four-lane divided road between Hexham and the NSW/Queensland Border. The project therefore forms a major part of the overall upgrade program and when constructed, would complete the four-lane divided road program. It would be jointly funded by the NSW and Australian governments.

The Woolgoolga to Ballina project is Australia's largest regional infrastructure project and will duplicate about 155 kilometres to four-lane divided road. The project starts about six kilometres north of Woolgoolga (north of Coffs Harbour) and ends about six kilometres south of Ballina.

When complete, the project will:

- Reduce overall length from 180 kilometres to about 167 kilometres, saving about 13 kilometres in travel distance
- Allow for a higher posted speed limit of up to 110 km/h
- Reduce travel time from 130 minutes to about 105 minutes, saving 25 minutes
- Reduce crash rates by an expected 27 per cent due to divided carriageways
- Improve travel reliability through better flood immunity, fewer incidents and more readily available alternative routes.

Key features of the upgrade include:

- Duplication of 155 kilometres of the Pacific Highway to a motorway standard (Class M) or arterial road (Class A), with two lanes in each direction and room to add a third lane if required in the future
- Split-level (grade-separated) interchanges at Range Road, Glenugie, Tyndale, Maclean, Yamba / Harwood, Woombah (Iluka Road), Woodburn, Broadwater and Wardell
- Bypasses of South Grafton, Ulmarra, Woodburn, Broadwater and Wardell
- About 40 bridges over rivers, creeks and floodplains, including major bridges crossing the Clarence and Richmond rivers
- Fifty-five underpasses and bridges over and under the highway to maintain access to local roads that crossing the highway
- Access roads to maintain connections to existing local roads and properties
- Structures designed to encourage animals over and under the upgraded highway where it crosses key animal habitat or wildlife corridors
- Rest areas located at about 50 kilometre intervals at Arrawarra, Pine Brush (Tyndale), north of Mororo Road and north of the Richmond River
- A heavy vehicle checking station near Halfway Creek and north of the Richmond River.

The Woolgoolga to Ballina upgrade does not include the completed Devils Pulpit and Glenugie upgrade projects.

Sections of the project are located adjacent to previously approved highway upgrades. As a result, the following approvals will also apply to the relevant sections of the project:

- Sapphire to Woolgoolga Pacific Highway upgrade – NSW Approval (06_0293) 13 January 2009
- Glenugie Pacific Highway upgrade – NSW Approval (09/0073) 17 December 2009, Commonwealth Approval (2009/5002) 13 January 2010
- Devils Pulpit Pacific Highway upgrade – NSW Approval (09_0179), 1 February 2011, Commonwealth Approval (2010/8586) 20 January 2012
- Ballina Bypass Pacific Highway upgrade – NSW Approval 22 May, 2003.

1.2 Staging

A Staging Report has been prepared and approved in accordance with the requirements of the NSW Condition of Approval A7 which states:

> *The Applicant may elect to construct and/or operate the SSI in stages. Where staging is proposed, the Applicant shall submit a Staging Report to the Secretary prior to the commencement of each proposed stage. The Staging Report shall provide details of:*
>
> *(a) how the SSI would be staged, including general details of work activities associated with each stage and the general timing of when each stage would commence; and*
>
> *(b) details of the relevant conditions of approval, which would apply to each stage and how these shall be complied with across and between the stages of the SSI.*
>
> *Where staging of the SSI is proposed, these conditions of approval are only required to be complied with at the relevant time and to the extent that they are relevant to the specific stage(s).*

The project is also approved under the Commonwealth Environment Protection and Biodiversity Act 1999 (012/6394 approval dated 14/08/14).

> *The Staging Report as required by NSW approval condition A7 must be submitted to the Minister prior to the commencement of each of the proposed stage(s). In accordance with NSW approval condition A7 the Staging Report must outline how the proposal will be staged. The Staging Report must also outline the threatened species and communities, and migratory species impact in each stage.*

The Staging Report describes the activities associated with the project stages and how compliance will be addressed across and between these.

Roads and Maritime proposes to construct the project in a number of stages. Given the nature of the project and range of procurement and delivery options involved, Roads and Maritime will update the staging report progressively as further details are confirmed. Stage 1 of the Woolgoolga to Ballina upgrade includes three construction activities. The general location of these stages is shown in Figure 1-2.

Stage 1:

1). Section 1 – Woolgoolga to Halfway Creek
2). Section 2 – Halfway Creek to Glenugie
3). Soft Soil preload construction undertaken in three waves of construction packaging to suit
    a). Wave 1- Soft soils works at Harwood
    b). Wave 2- Soft soils works at Whytes Road to Pimlico
    c). Wave 3- Soft soils works between Tyndale and Iluka Road and at Tuckombil Canal, Woodburn

This Compliance Tracking Report is for the third reporting period, May to November 2016, for the Woolgoolga to Halfway Creek - Section 1 of the W2B Project as highlighted in Figure 1-2.

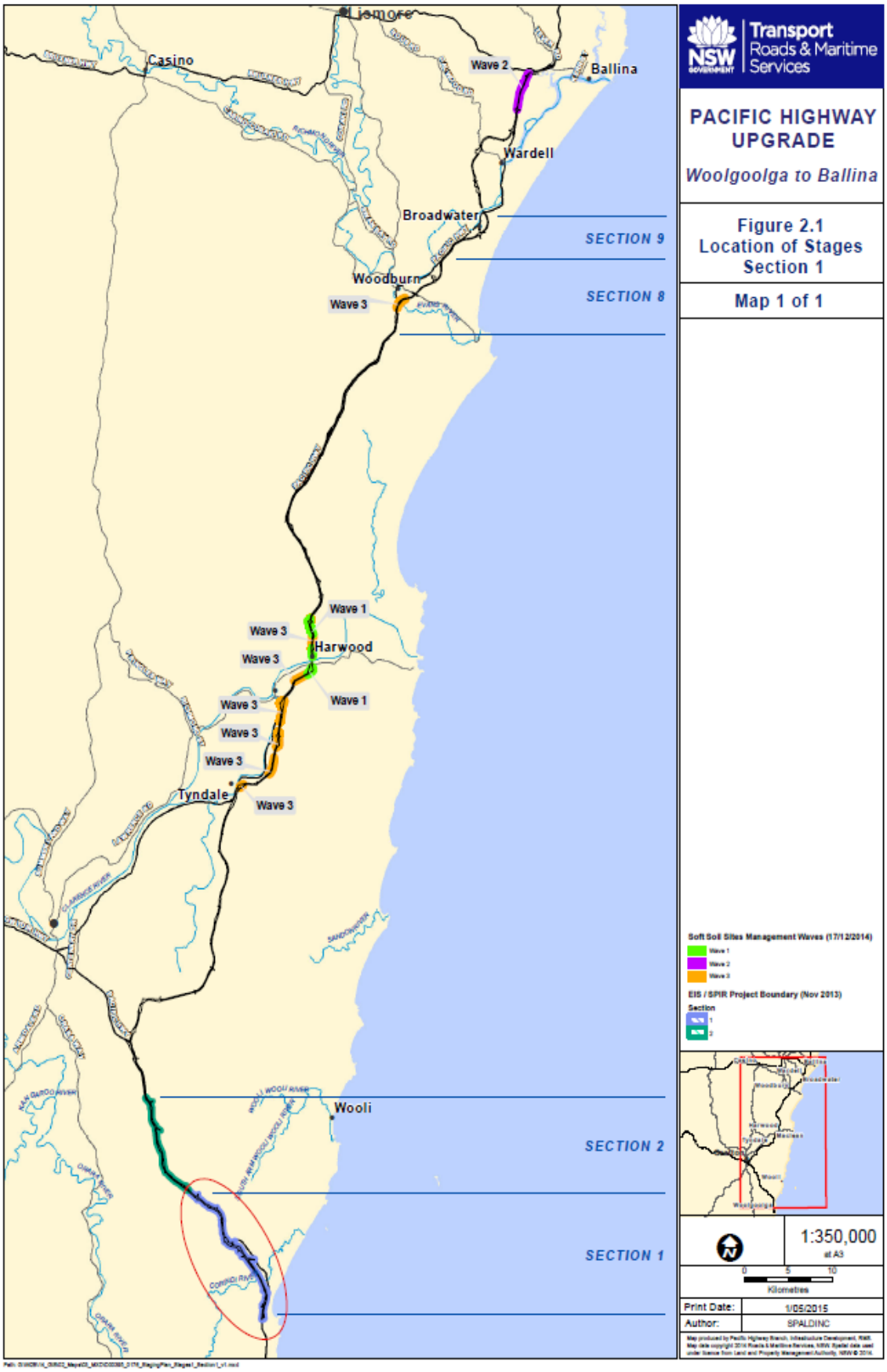


Figure 1-2: Location of all Stage 1 activities, specifically highlighting Section 1 Woolgoolga to Halfway Creek.

1.2.1 Woolgoolga to Halfway Creek

The report details the environmental performance of the Woolgoolga to Halfway Creek Project from May to November 2016, which is approximately 14.7 kilometres, comprising of a four-lane divided carriageway. The project comprises of –

- three bridge crossings of waterways or floodplains
- four bridges and underpasses to maintain access along local roads crossed by the project
- service roads and access roads to maintain connections to existing local roads and properties
- multiple fauna connectivity structures including rope bridges, glider poles, drop down structures & fish passages
- rest area located at the Arrawarra Interchange

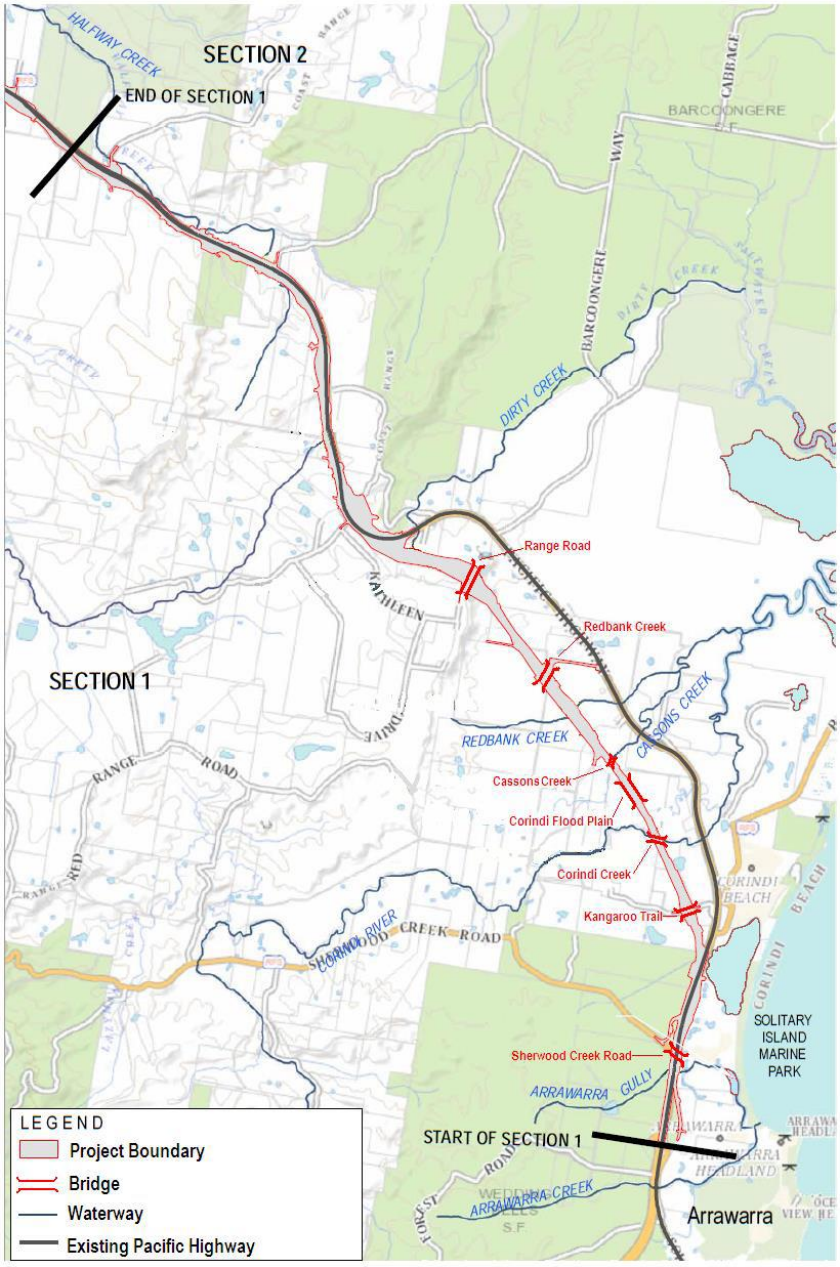


Figure 1-3 illustrates the features W2HC

1.3 Purpose

The key objective of the Compliance Tracking Program is to track compliance with the requirements of the Minister's Conditions of Approval during the design and each stage of construction of the Project. This report addresses the third six months of construction of the W2HC project from 19 May to 19 November 2016.

1.4 Environmental management system overview

The Construction Environmental Management Plan (CEMP) is the primary system to manage and control the environmental aspects of the Project during construction. It also provides the overall framework for the system and procedures to ensure environmental impacts are minimised and legislative and other requirements are fulfilled. The strategies defined in the CEMP have been developed with consideration of the Project approval requirements, safeguards and mitigation measures presented in the environmental assessment and approval documents. The CEMP establishes the system for implementation, monitoring and continuous improvement to minimise impacts from the Project on the environment.

This Compliance Tracking Program is separate to the CEMP, but is part of a suite of environmental management documents prepared for the Project.

1.5 Relevant documentation

Documentation relevant to the Compliance Tracking Program includes:

- RMS, *Woolgoolga to Ballina. Upgrading the Pacific Highway. Environmental Assessment* (December 2012)
- RMS, *Woolgoolga to Ballina. Upgrading the Pacific Highway. Submissions and Preferred Infrastructure Report* (November 2013)
- New South Wales *Environmental Planning and Assessment Act 197*9 (SSI-4963), approval dated 24 June 2014
- Commonwealth *Environment Protection and Biodiversity Act 1999* (012/6394), approval dated 14 August 2014

1.6 Scope of activities undertaken during the reporting period

Throughout the six-month reporting period, a range of works have occurred across the project. A summary of these activities are listed below.

Structures

- Sherwood Creek Road has been completed
- Kangaroo Trail Road has been completed
- Corindi Creek bridges completed and open to site traffic
- Corindi Floodplain bridges approximately 95% complete. Abutment B approach slabs remaining
- Cassons Creek bridges approximately 90% complete, all decks poured. Southbound completed. Northbound twin rail remaining.
- Corindi Access Rd is approximately 70% complete, south bound decks poured. Northbound Abutment B Approach Slab and twin rail remaining. Southbound completed and open to traffic.
- Range Road bridge completed.
- All offsite fabrication has been completed at the pre-cast yard in Coffs Harbour

Concrete

- Paving trials were completed in August and September 2016
- Production of mainline lean mix concrete has been completed south of Corindi Creek bridge with the exception of the stage 2 pavement works on the southbound carriageway south of culvert 2000, due in mid-2017.
- Production of mainline lean mix concrete has been completed north of Range Road on the northbound carriageway with the exception of stage 2 pavement works on the southbound carriageway north of Dundoo Reach, due in mid-2017.
- Production of mainline Plain concrete paving has been completed south of Corindi Creek bridge with shoulder paving due to be completed in early 2017.
- Production of mainline plain concrete paving has commenced north of Range Road on the northbound carriageway and is expected to be completed by December 2016.
- Handpour paving works have commenced at the northern end of the project and these works will continue into 2017.
- Mainline paving works will continue into 2017 between Corindi Creek Bridge and Range Road.
- The total lean mix concrete placed to date is approximately 16,000m^3 and the total plain concrete paving placed to date is approximately 14,000m^3.

Drainage

- Cross drainage 85% complete, southern switch completed in November 2016 which provided access to the stage 2 cross drainage lines CD0073, CD140, CD166 and culvert 320 which has commenced in November 2016.
- Pavement drainage approximately 75% complete, continuing currently through Cut 9, Fill 9, Fill 10, then to Cut 8.
- Remaining cross drainage, culverts and pavement drainage to occur following northern switches in 2017.

Blasting

- Production blasting was completed in November 2016 for the project.
- A total of fifty (50) blasts have been fired on the project since commencement. Forty one (41) blasts were fired in cut 8, which is the primary source of material for the project. Four (4) shots were fired in cut 14, three (3) shots were fired in cut 10 and two (2) shots were fired in cut 15.
- Blasted rock, primarily from cut 8, has been processed for use throughout the project.

Sedimentation basins & erosion and sediment controls

- 43 licenced sedimentation basins have been commissioned in total across the project in consultation with the project soil conservationist and EPA
- 24 licensed sedimentation basins are currently on the project Environmental Protection Licence, 19 sedimentation basins have been decommissioned and 3 are to be constructed
- OHLY provide the projects Sedimentation Basin and Irrigation Register to EPA monthly or when requested, including when a basin is been decommissioned or commissioned.
- Progressive erosion and sediment control plans continue to be developed throughout each construction stage.

Environment Training

- Incident learnings undertaken as required.
- Site awareness environmental training, for example endangered species (Giant Barred Frog and Spotted-tailed Quoll).

- Weekly toolbox and daily pre-start environmental updates
- Bi-weekly environmental induction covering current environmental risks and their mitigation including legislation

Additional construction works undertaken during the reporting period

- Drainage blanket at cut 3, cut 5 and cut 6, and northbound from cut 11 to cut 19 complete
- Chainage 10300 to chainage 14300 northbound seal. Paving on going in this section
- Reinforced landscape mounds complete
- Range Road East was successfully completed on 12th July 2016
- Seal complete from Corindi Creek to Corindi access road (northbound and southbound)
- Bulk earthworks are approximately 95% completed across the project.
- Clearing and grubbing operations have been completed for the project.
- 90% of the electrical / Telstra relocation works have been completed.
- Batch plant at Taylors Run in operation since October 2016. A total of 35,000 m^3 of concrete produced to date.
- Concrete paving: 35,000 m^3 placed between LMC and PCP.
- Switch traffic to northbound Ch0 – Ch1800 completed 25 November 2016

1.7 Performance of environmental controls that have been implemented

Erosion and sediment control

The progressive erosion and sediment control plans are continually being implemented by OHLY in consultation with the project Soil Conservationist & RMS Soil Conservationist. The project Soil Conservationist continues to assist OHLY by providing advice on erosion and sedimentation controls, particularly in sensitive areas, including decommissioning licensed sedimentation basins. Engineers, environmental personnel and foreman continue to work collaboratively in developing erosion and sediment control plans to ensure effective onsite implementation.

A range of natural erosion controls continue to be adopted, specifically the use of mulch and earth bunds, etc. Where possible geofabric and sediment fence are avoided or installed as a final solution in an aim to prevent waste.

Protection of waterways

Transverse drainage works have continued along the entire project alignment, with both box culverts and pipe culverts being constructed. Prior to each culvert works, a series of onsite planning sessions are undertaken, which detail the environmental controls and requirements for the installation of the culverts. Throughout the works, weekly environmental joint inspections occur, involving earthworks and drainage teams to provide interface in managing culvert works. Removal of temporary crossings continues to be prioritised as permanent works become finalised over waterways. There are only three temporary waterway crossings remaining on the project

Air Quality

To manage dust onsite, multiple water carts have been working continuously throughout the project to minimise generation of dust from construction activities. Cover of exposed surfaces, using cover crop seed etc is continuing, which also assist with dust control. Dust from haul roads is minimised through enforcement of speed limits onsite and use of water carts.

Up to four crushing operations have been operating at any one time during the reporting period, often close to the existing Highway as a result of limited space. These operations are controlling the dust using multiple sprayers, using larger rain tanks and wetting down stockpiles.

Weekly toolbox talks continue to emphasise the importance of speed limits onsite for safety and environmental reasons. Stabilised haul roads are also assisting with dust control together with street sweepers at these locations. Other measures include stabilised access points throughout the project and use of soil binders to suppress dust.

Water generated from sedimentation basins and sediment traps has preferentially been reused as another water source of dust suppression across the project.

Noise & Vibration

Prior to each production blast, detailed designs have been completed and approved to ensure the primary impacts, air blast and vibration levels are managed according to the rock type, weather and distance to sensitive receivers. No noise or blast exceedances have occurred to date or within the reporting period.

Attended noise monitoring occurs each month at five pre-determined noise locations. No exceedances have occurred to date.

The project obtained a six monthly out of hours in August 2016, which required a 48-hour notification prior to any out of hour's works for key activities including bridge construction, local roads, drainage works, traffic switches and road maintenance. Separate out of hours approvals were obtained for operation of the Taylors Run batch plant and paving operations, which required attended out of hours noise monitoring.

Heritage

There have been six (6) desktop heritage assessments undertaken during the reporting period, as summarised below:

- 8 June 2016 – Desktop assessment of an area east of Eggins drive as part of an assessment for a utilities relocation.
- 4 July 2016 – Desktop assessment of an area at Corindi Creek for scour remediation works.
- 4 July 2016 - Desktop assessment of an area at Ch13700 on the east of McPhillips Road for the construction of a headlight screening mound assessment.
- 11 August 2016 - Desktop assessment of an area outside the western boundary at Ch1800 for installation of fauna rope bridge stay anchors.
- 15 November 2016 – Desktop assessment as part of a hazardous tree removal assessment.
- 19 November 2016 - Desktop assessment of the Corindi Dam, Corindi Beach for water extraction.

The project continues to maintain a positive working relationship with the Aboriginal representatives.

Waste

The waste hierarchy is continually being adopted onsite, specifically Reduce, Reuse, Recycle. Where possible, waste reuse is prioritised onsite, particularly for surplus unsuitable material, concrete, old asphalt pavements, steel and timber as this also has cost benefits.

Waste oil and oily materials are transported to the project workshop and removed regularly by a local waste recycling operator. Purchasing materials which have a recycled content occurs where possible. Some materials (excess spoil and reclaimed asphalt, for example) have been sought by external parties with development consents and addressed under waste procedures and Section 143 permits, which also assist the project in reducing the volume of waste while supporting beneficial reuse opportunities.

Mulch is continually being used onsite for erosion and sediment control is working well.

Concrete waste generated by the project is also reused for embankment construction after being crushed. There have been reasonable volumes of concrete waste recycled on the project for

reuse. Steel recycling also occurs on the project. A licenced waste metal contractor collects the material regularly. Many concrete pipes and box culverts have been given to farmers and other external parties for reuse rather than crushing them.

The project also offers waste timber pallets & other materials to the Woolgoolga Community Men's Shed, a local organisation supporting men's health and wellbeing.

Fauna

Ecological monitoring continued during the reporting period. Results are summarised in Section 3.6.

During the reporting period measures have been both continued or implemented in order to mitigate impacts on fauna. These include the following:

- Temporary frog fence has remained in place and maintained in order to minimise the risk of threatened frogs entering the work area. No threatened frog mortalities have been identified during construction.
- The project has recorded an increase in numbers from the baseline for the Giant Barred Frog at Corindi Creek upstream and downstream, which illustrates a healthy ecosystem.
- Operational Fauna exclusion fencing is progressively being installed throughout the project.
- Any clearing which has taken place has been done in accordance with the Threatened Flora and Fauna Management Plan. This has resulted in no known mortalities of threatened fauna during clearing.
- The Project rescued three (3) juvenile Spotted-tailed Quolls which were taken to the Currumbin Wildlife Sanctuary for care after their mother was hit by a public motorist near Falconers Lane.
- Green-thighed Frog ponds were constructed at Redbank Creek as per the Threatened Frog Management Plan.
- Fauna furniture and refuge poles have been installed in several underpasses.
- Rope bridge and glider pole locations have been finalised. Installation starting late November.

2. Program requirements

The Compliance Tracking Program has been prepared as a requirement of CoA D27. The requirements, as stipulated by this CoA, are detailed in 2.1.

Table 2-1 CoA requirements for the Compliance Tracking Program

CoA No.	Requirement	Reference
D27	The Applicant shall prepare and implement a **Compliance Tracking Program**, to track compliance with the requirements of this approval, prior to the commencement of construction and operate from the date of its approval to a minimum of one year following commencement of operation, or as otherwise agreed by the Secretary. The Program shall be prepared for the approval of the Secretary, and include, but not necessarily be limited to:	This document
(a)	provisions for the notification of the Secretary prior to the commencement of construction and prior to the commencement of operation of the SSI (including prior to each stage, where works are being staged);	Section 2.1
(b)	provisions for periodic review of the compliance status of the SSI against the requirements of this approval;	Section 2.2
(c)	provisions for periodic reporting of compliance status to the Secretary, including a Pre-Construction Compliance Report, prior to the commencement of construction, and a Pre-Operation Compliance Report prior to the commencement of operation. These reports may be staged to suit the staged construction/operation of the SSI;	Section 2.3
(d)	a program for independent environmental auditing in accordance with ISO 19011:2003 - Guidelines for Quality and/or Environmental Management Systems Auditing;	Section 2.4
(e)	mechanisms for recording environmental incidents during construction and actions taken in response to those incidents;	Section 2.5
(f)	provisions for reporting environmental incidents to the Secretary and relevant public authorities during construction;	Section 2.6
(g)	procedures for rectifying any non-compliance identified during environmental auditing, review of compliance or incident management; and	Section 2.7
(h)	provisions for ensuring all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.	Section 2.8

2.1 Secretary notification

CoA D27 (a) requirement:

"provisions for the notification of the Secretary prior to the commencement of construction and prior to the commencement of operation of the SSI (including prior to each stage, where works are being staged)"

Construction will commence on each stage of the Project according to the Staging Report, following approval by the Secretary of the relevant CEMP, associated environmental plans and other relevant documentation required by the approval.

RMS will advise the Secretary in writing prior to the commencement of construction and operation.

The CEMP for Section 1 was approved by the Department of Planning and Environment on 19 May 2015, with the Environment Protection Licence 20590 subsequently issued on 19 May 2015. Construction subsequently commenced on the 19 May 2015.

2.2 Period compliance review

CoA D27 (b) requirement:

"provisions for periodic review of the compliance status of the SSI against the requirements of this approval"

RMS will review the status of compliance and submit periodic compliance reports to the Secretary as follows:

- Prior to the commencement of construction.
- Six months after the commencement of construction and then at six monthly intervals thereafter.
- Prior to the commencement of operation.

This report captures the third six months of construction for the period 19 May to 19 November 2016. The compliance tracking tables (contained to Appendix A) form an integral component of this periodic review.

These tables establish a format for recording compliance and include:

- Description of the environmental obligation.
- The stage of the project to which it relates.
- Status.
- Responsibility

2.3 Period compliance reporting

CoA D27 (c) requirement:

"provisions for periodic reporting of compliance status to the Secretary, including a Pre-Construction Compliance Report, prior to the commencement of construction, and a Pre-Operation Compliance Report prior to the commencement of operation. These reports may be staged to suit the staged construction/operation of the SSI"

Revision 2 (dated 7 July 2015) of this Compliance Tracking Report documented the pre-construction compliance status. This report (Revision 6) is the third of the six monthly Compliance Tracking Reports, which captures the construction compliance status during the period to 19 May to 19 November 2016.

Sections 1.6 to 1.7 summarises the environmental and construction information relevant during this six month reporting period for this report.

At intervals prescribed in Section 2.2 the status of compliance will be reviewed and reported to the Secretary in the form of a Compliance Tracking Report. The Compliance Tracking Report includes:

- Scope of the activities undertaken during the reporting period (Section 1.6)
- Performance of environmental controls that have been implemented (Section 1.7)
- Compliance with CoA, revised EMM as recorded in the compliance tracking tables (Appendix A)
- Non-compliances during the reporting period (Section 2.7)
- Detail of all incidents recorded and action taken during the reporting period (Section 2.5)
- Outcomes of monitoring undertaken over the reporting period and review of compliance against relevant criteria (Section 3).
- Outcomes of audits and ERG inspections undertaken during the reporting period (Section 2.4)
- Detail of substantiated environmental complaints received, responses taken and current status (Section 4).

2.4 Independent environmental auditing

CoA D27 (d) requirement:

"a program for independent environmental auditing in accordance with ISO 19011:2003 - Guidelines for Quality and/or Environmental Management Systems Auditing"

RMS will ensure that independent audits are undertaken in accordance with ISO 19011:2003 - *Guidelines for Quality and/or Environmental Management Systems Auditing* at six monthly intervals throughout construction. The audits will assess compliance against the CoA and SoCs.

On 19 & 20 September 2016, the project was audited by RMS independent auditor on environment, quality, industrial relations survey, traffic control, Aboriginal participation, plant, training management and safety regarding compliance and implementation.

In summary, the environmental management system and processes are considered robust and clearly articulate how the requirements of legislation, Conditions of Approval, RMS specifications and the EPL are to be met. It was considered that excellent work is occurring in the area of revegetation of disturbed areas, and a topsoil/mulch mix for application to vegetation areas was developed that has been found to be highly effective method of stabilising exposed areas and enabling maximum use to be made of site-won topsoil. There was one (1) Corrective Action Report (CAR) and one (1) Observation of Concern (OoC) raised during the audit for environment.

The Corrective Action Report, related to the asbestos and waste oil disposal records not being recorded on the annual WRAPP report or the project waste register. In response to the CAR, the project entered the asbestos and waste oil records into the waste register and also the current WRAPP report. The project also requested the WRAPP report to be undertaken annually and not every six months as per RMS specification, which was approved by RMS.

The Observation of Concern related to the sediment basin sediment storage markers onsite do not have marks to indicate when 60% of the sediment storage zone has been filled. In response to the OoC, the project recorded the 60% sediment zone mark on each sediment basin marker.

All actions have been satisfactorily closed out.

Daily & weekly site inspections are undertaken on the project by the Foreman, Engineers and the Superintendent. Weekly formal inspections are undertaken and recorded on the system as per requirements in the project CEMP.

Regular Soil Conservationist inspections are also undertaken on the project. Reports outlining the outcomes of the Soil Conservationist are provided to RMS. RMS also have an independent Soil Conservationist conduct regular inspections to review Blue Book compliance. These are joint inspections with the project team to optimise environmental outcomes for the project.

RMS and the ER conduct site inspections to review environmental performance. The ERG inspections and meetings occur monthly.

2.5 Incident reporting and response

CoA D27 (e) requirement:

"mechanisms for recording environmental incidents during construction and actions taken in response to those incidents"

RMS's Environmental Incident Classification and Reporting Procedure will be implemented for all environmental incidents for the Project. The full procedure is provided in Appendix A6 of CEMP.

http://home.rta.nsw.gov.au/dts/cserv/os/original/environment/ems-tp-07.pdf

Typically, environmental incidents will be notified verbally immediately of any incident occurring to the RMS Representative and the Environmental Representative. Incident reports will be provided to RMS Representative and the Environmental Representative within 24 hours of the incident occurring, including lessons learnt from each environmental incident and proposed measures to prevent the occurrence of a similar incident. All efforts will be undertaken immediately to avoid and reduce impacts of incidents and suitable controls put in place. Incidents will be closed out as quickly as possible, taking all required action to resolve each environmental incident.

The EPA will be notified of any environmental incidents or pollution incidents on or around the site via the EPA Environment Line (telephone 131 555) in accordance with Part 5.7 of the *Protection of the Environment Operations Act 1997* (NSW) (POEO Act). The circumstances where this will take place include:

- If the actual or potential harm to the health or safety of human beings or ecosystems is not trivial.
- If actual or potential loss or property damage (including clean-up costs) associated with an environmental incident exceeds $10,000.

The Project will maintain all records relating to environmental incidents. Roads and Maritime Environment Branch will also provide assistance with maintaining records relating to environmental incidents.

During the six months reporting period, there were a total of seven (7) environmental incidents. A summary of these environmental incidents and the corrective actions are summarised below. All the incidents recorded during the reporting period have been closed out.

- 10 June 2016: Casson Creek bridge deckpour underway. RMS identified no environmental control plan had been implemented for curing water as per approved W2HC EN-EWMS-23 Deckpours and Curing. No material harm had occurred, and was subsequently was categorised as a potential category 2 incident. EPA were notified. Grab sample of Cassons Creek water was taken and pH tested whilst deckpour curing was underway. pH – 5.9 is consistent with background monitoring for Cassons Creek. Two 1000 litre IBC receptacles placed under bridge deck to capture deck water (from PVC pipes). Captured water was pH tested and reused onsite. Formwork in place along bottom edge of bridge deck was sealed with silicon. Extra form was placed and sealed to bridge gaps in super-T. PVC pipes were placed at drainage points tdirect any potential runoff into scour, greater than 20 metres from Creek. The corrective action also included ensuring environmental control plans are in place for remaining creek/waterway deckpours and issued to the ERG. Work crews to be toolboxed on incident and importance of appropriate planning when working near waterways.
- 27 June 2016: in accordance with EPL 05.9, following 340mm rainfall received from 3 to 5 June 2016, 5-day design capacity was not reinstated on three licensed sedimentation

basins. Additionally, following 64.2mm rainfall received from 13 to 20 June 2016, 5-day design capacity was not reinstated on three licensed sedimentation basins. 34 licensed basins were discharged. The site received minor flooding/heavy rainfall (400mm) which resulted in the catchments becoming saturated. WH2C consider safe access to be paramount when working around water. Crews were deployed once the site was considered safe and in a buddy system to test, treat and flocculate basins. Leading up to the rain event all basins were pre-treated with gypsum to assist expedite flocculation. Once the basins were considered safe to access, testing and treatment commenced on basins which were not still receiving site runoff. Basins which were still receiving runoff were treated after Day 2 as flocculation could not be achieved as a result of them not turning and access. It was noted that discharging a basin within 5 days of a minor flood is challenging and presents many safety hazards. The project has undertaken due diligence to attempt to meet EPL 05.9 condition given the circumstances, as a result the incident was classed as a potential category 2.

- 1 July 2016: a subcontractor excavator was tracking in the crushing pad at Hawthorn Close when the operator noticed hydraulic fluid from behind the machine. The Operator immediately stopped excavator and bunded the 100 litre spill on the crushing pad. Operator & Leading Hand were commended on how quickly they responded and contained the spill using the nearby spill kit and earth bund. Spill was cleaned up, stockpiled and taken to the Grafton Licensed waste facility. The corrective actions are to conduct daily checks, report spills and act swiftly with containment. The incident was classed as a potential category 2 as no material harm occurred.
- 8 July 2016: whilst desilting basin #895 at Range Road West, a moxie rolled over causing approximately 20 litres of hydraulic oil to spill onto ramp. Spill was completely contained using spoil material. No hydraulic oil left the site boundary or entered the nearby drainage line and was subsequently classed as a potential category 2. Contaminated material including spoil will be taken to Grafton landfill.
- 15 August 2016: in accordance with EPL 05.9, following 123mm rainfall received from 3-7 August 2016, the 5-day design capacity was not reinstated on three licensed sedimentation basins. The three (3) outstanding basins were all discharged to their design capacity immediately after Day 5. Basin #1030R will be decommissioned as no site water is being directed to this basin following the traffic switch. Similarly, basin #27L and #38L, including other permanent basins along Fill 1-3 will be decommissioned as this catchment is now sealed and basin access will be limited without traffic control. All basins were pre-dosed with gypsum leading up to forecasted rain event (noting residual gypsum dissipation following east coast low events). Daily testing and flocking with gypsum and calcium chloride occurred once landowner approval had been granted at PB1030R on 10 August as previous access was prohibited off Highway following Range Road switch. Basins PB27L and PB38L are permanent basins within a low lying area which are difficult to manage following a high rain event due to inundation. Also, culvert 320 works are currently been completed and prioritised on Eggins Drive, which will assist mitigate inundation in catchment. This incident was classed as a potential category 2.
- 17 October 2016: 4.4mm rainfall event caused concrete pavement curing resin (which had not yet set) to run into permanent clean water drain to the west of Fill 3. Curing resin had runoff northbound paving run, between approximate chainages 2080 and 2240. Weather forecast/radar was continuously been monitored by Paving Supervisor. Risk of rainfall was identified as low-moderate, paving ceased early and 140 metres of tarp was deployed. 4.4mm of rainfall occurred. Turbidity curtain and hydrocarbon boom were in position downstream of culvert 2000. Watercart was deployed to begin de-watering drain. Water with diluted resin reused onsite as dust suppression in cut 8. EPA and RMS notified. The paving Environmental Work Method Statement (EWMS) was updated to state a rainfall criteria to allow paving to continue in addition to having equal amount of tarp to that which is been paved. No resin left the project boundary and no material harm occurred resulting in a potential category 2.
- 16 November 2016: a subcontractor truck and dog had a drive shaft failure spilling approximately 10 litres of hydraulic fluid onto the asphalt at Kangaroo Trail Road. Immediate response, no offsite impact and RMS immediately notified. Truck and dog ceased immediately and the operator contained the spill. The truck and dog was taken

offsite for repair. Spilt material was taken to Grafton Waste Facility. No material harm resulted in the spill and thus the incident was classed as a potential category 2.

All incidents have been closed out.

2.6 Incident reporting to Secretary

CoA D27 (f) requirement:

"provisions for reporting environmental incidents to the Secretary and relevant public authorities during construction"

The Secretary will be notified of incidents in writing in circumstances where:

- The actual or potential harm to the health or safety of human beings or ecosystems is not trivial.
- The actual or potential loss or property damage (including clean-up costs) associated with an environmental incident exceeds $10,000.

An initial notification to the Secretary will be made verbally within two working days. The written notification will be made within 10 working days.

Where incidents are considered to be minor, ie do not meet the criteria above, they will be reported to the Secretary in accordance with the compliance tracking program at frequencies prescribed in Section 2.2.

All environmental incidents are being recorded and reported to the EPA, ER, RMS & Fisheries through the ERG, monthly reporting or immediate notification as per the procedure.

2.7 Addressing non-compliance

CoA D27 (g) requirement:

"procedures for rectifying any non-compliance identified during environmental auditing, review of compliance or incident management"

Section 8.4 of the CEMP describes in detail the system for tracking compliance prior to and during construction.

Where a non-compliance has been identified, a corrective/preventative action (or actions) will be implemented.

Corrective/preventative actions will be entered into the OHLY quality system database and include detail of the issue, action required and timing and responsibilities. The record will be updated with date of close out and any necessary notes. The database will be reviewed regularly to ensure actions are closed out as required.

The close-out of required actions will be reviewed during forums including Environmental Representative and ERG inspections, and the Environmental Representative will be actively involved in the review and resolution of non-compliances.

A total of two (2) Environmental Protection Licence (EPL) non-compliances occurred during the reporting period, specifically –

- EPL O5.9 – 27 June 2016: following 340mm rainfall received from 3 to 5 June 2016, 5-day design capacity was not reinstated on three licensed sedimentation basins. Additionally, following 64.2mm rainfall received from 13 to 20 June 2016, 5-day design capacity was not reinstated on three licensed sedimentation basins. 34 licensed basins were discharged. The site received minor flooding/heavy rainfall (400mm) which resulted in the catchments been saturated. WH2C consider safe access to be paramount when working around water. Crews were deployed once the site was considered safe and in a buddy system to test, treat and flocculate basins. Leading up to the rain event all basins

were pre-treated with gypsum to assist expedite flocculation. Once the basins were considered safe to access, testing and treatment commenced on basins which were not still receiving site runoff. Basins which were still receiving runoff were treated after Day 2 as flocculation could not be achieved as a result of them not turning and access. It was noted that discharging a basin within 5 days of a minor flood is challenging and presents many safety hazards. The project has undertaken due diligence to attempt to met EPL 05.9 condition given the circumstances, as a result the incident was classed as a potential category 2.

- EPL 05.9 – 15 August 2016: following 123mm rainfall received from 3-7 August 2016, the 5-day design capacity was not reinstated on three licensed sedimentation basins. The three (3) outstanding basins were all discharged to their design capacity immediately after Day 5. Basin #1030R will be decommissioned as no site water is being directed to this basin following the traffic switch. Similarly, basin #27L and #38L, including other permanent basins along Fill 1-3 will be decommissioned as this catchment is now sealed and basin access will be limited without traffic control. All basins were pre-dosed with gypsum leading up to forecasted rain event (noting residual gypsum dissipation following east coast low events). Daily testing and flocking with gypsum and calcium chloride occurred once landowner approval had been granted at PB1030R on 10 August as previous access was prohibited off Highway following Range Road switch. Basins PB27L and PB38L are permanent basins within a low lying area which are difficult to manage following a high rain event due to inundation. Also, culvert 320 works are currently been completed and prioritised on Eggins Drive, which will assist mitigate inundation in catchment.

These non-compliances were immediately reported to EPA and discussed in detail with the ERG. The above non-compliances have been closed out.

2.8 Employee inductions

CoA D27 (h) requirement:

"provisions for ensuring all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities"

Section 5.1 of the CEMP describes in detail how all personnel working on the Project are aware of their environmental obligations.

During construction, the Environmental Manager (or delegate) will conduct the environmental component of the site inductions. The environmental component will include, but not limited to, an overview of:

- Relevant details of the CEMP including purpose and objectives.
- Key environmental issues.
- Conditions of environmental licences, permits and approvals.
- Specific environmental management requirements and responsibilities.
- Mitigation measures for the control of environmental issues.
- Incident response and reporting requirements.
- Information relating to the location of environmental constraints.

A record of all environment inductions will be maintained and kept on-site.

3. Environmental Monitoring

Monitoring and testing has been undertaken for surface / ground water quality, noise, dust and flora and fauna in accordance with the Construction Environmental Management Plan (CEMP) and subsequent management plans during the reporting period. Monitoring results are provided in Appendix B. Further details on monitoring during the reporting period are provided below.

3.1 Surface Water

OHLY undertake monthly surface water quality monitoring at predetermined locations in accordance with the Surface Water Quality Programme. Eight (8) waterways are monitoring at upstream and downstream locations. Water quality results are presented in Appendix B. The monitoring results are uploaded onto the project environmental monitoring database and conveyed to the Environmental Review Group (ERG) on a monthly basis. Water quality parameters include – pH, turbidity, temperature, dissolved oxygen, electrical conductivity and nutrients.

The water quality meter is calibrated on-site prior to any water quality monitoring and is serviced by qualified technicians recommended by the manufacturer.

The following information provides a discussion on the results during the reporting period.

- During the reporting period, the site received less or consistent rainfall compared to the historical averages from the Bureau of Meteorology during May, July, September and October 2016.
- Consistent with the pre-construction water quality data, the results illustrate variability throughout the reporting period. Noticeable changes occur following high rainfall events, specifically two East Coast Low events in June (approx. 350mm) and August (approx. 100mm) leading to elevated levels in Total Suspended Solids, dissolved oxygen and turbidity.
- pH values are general consistent with between upstream and downstream at each creek site with slightly acidic values between 5.5 to 6.5 for each creek line.
- The laboratory results for oil and grease displayed some variability throughout the monitoring period (US and DS) although Hydrocarbon or BTEX detection levels were not triggered.
- No elevations in nutrients or heavy metals were observed during the reporting period.
- Overall, sample results have not indicated any impact has occurred from project works on the downstream environments.

Controls are constantly monitored and reviewed as part of the rainfall and weekly inspection process, taking into account water quality results and changing work environments.

In relation to sediment basins, flocculation is being undertaken to ensure the discharge criteria for pH and turbidity is met prior to releasing a sediment basin, within or before the five (5) day EPL condition. Results are provided to EPA in the EPL monthly reports. The use of gypsum at inlets and use of fine gypsum or calcium chloride continues to assist in reducing timeframes for release of sediment basins.

A trained onsite crew manage the 43 basins across the project which includes, testing, treating, flocking and ensuring signage and basin capacity meet the requirements under the projects EPL.

3.2 Blast & Vibration

During the first reporting period (May to November 2015), the project sought increased blast and vibration limits at Cut 8, Cut 10, Cut 14 and Cut 15, in accordance with the CoA B24 and EPL L3.5. The increased blast limits only apply to where there are residential agreements.

There have been a total of 24 blasts have been fired during this reporting period. Twenty one (21) shots were fired in cut 8, which is the primary source of material for the project. One (1) shot was fired in cut 10 and two (2) shots were fired in cut 14. All of the twenty one production blasts were below the 125dB blast overpressure and 25mm/s peak particle velocity (See Appendix B).

Blasted rock continues to be processed for use throughout the project

3.3 Noise Monitoring

Monthly attended noise monitoring continues across the project at five (5) pre-determined sites in accordance with the approved Noise and Vibration Management Plan. No exceedances were identified during the reporting period above the noise objective for each particular noise catchment. The results of the monthly monitoring, including out of hours monitoring and blast results are tabulated at each ERG, where no concerns have been raised to date (See Appendix B).

3.4 Air Quality

Monthly dust monitoring occurs at 12 locations across the project. The results of the dust monitoring are compared to the prescribed dust criteria of 4g/m^2/month for the project (refer Appendix B).

In summary, the following was noted during the reporting period –

- DDG1, DDG10 and DDG11 were above the 4g/m^2/month in June 2016. DDG1 was significantly higher (2,412.4 g/m^2/month) as a result of the gauge been tampered with. DDG10 was elevated (9.1 g/m^2/month) as a result of a production blast at Cut 15 directly opposite the dust gauge. DDG11 was slightly elevated (4.8 g/m^2/month) as a result of a broom sweeper working immediately next to the gauge on McPhillips Road as all this catchment is sealed and finished works.
- All dust gauges were within the allowable limit during July 2016, August 2016, and November 2016. The allowable limit is 4 g/m2/month.
- DDG3 was slightly above the 4g/m^2/month during September 2016. The 4.5 g/m^2/month was attributed to the batch plant operations and use of Taylors Run. An additional water cart was allocated to this area to further control any potential dust.
- DDG2 and DDG3 were above the criteria during October 2016. DDG2 had been tampered with (26.9 g/m^2/month) and DDG3 at the batch plant was only slightly elevated (4.6 g/m^2/month) which was attributed to high winds.

EPA were notified immediately when an exceedance occurred and results discussed in detail at the monthly ERG meetings. Water carts are continuously used to reduce dust emissions across the project with good results.

3.5 Groundwater

Groundwater monitoring was undertaken in accordance with the approved Water Quality Monitoring Program during the reporting period. The results of the monitoring undertaken during the current reporting period are available in appendix B. An interpretive report for these results is expected to be available mid-2017.

3.6 Flora and Fauna

Nest Box Monitoring

In accordance with the Nest Box Management Plan, 100% of the nominated nest boxes have been installed on the project, and nest box monitoring has been undertaken as per the approved nest box monitoring plan.

- Year 1 winter nest box inspection was undertaken in August 2016. This in accordance with the Nest Box Management Plan.
- Six vertebrate species were observed occupying nest boxes during the 2016 winter inspection and a further two species were probable users based on nesting evidence.
- Squirrel glider (Petaurus norfolcensis) which is a listed threatened species was the most common species occupying boxes and was recorded in squirrel glider, scansorial, cockatoo and treecreeper boxes. Sugar glider (Petaurus breviceps) and feathertail glider

(Acrobates pygmaeus) were the next most commonly detected species and each occurred in six box types.

- In addition to occupied boxes, a further 39% of boxes contained evidence of use by vertebrates.
- Overall, 75 boxes (56.4%) were either occupied or showed evidence of use by vertebrate fauna.

Threatened Frog Monitoring

Green-thighed Frog

Population monitoring was undertaken in accordance with the Threatened Frog Management Plan over this compliance reporting period.

A summary of this monitoring for Sections 1 and 2 (Woolgoolga to Glenugie) is as follows:

Year 1 monitoring for the Green-thighed Frog (Litoria brevipalmata) was performed at five paired BACI (Before-After-Control-Impact) sites (n=10) located in Section 1 and 2 of the Woolgoolga to Ballina Upgrade. Surveys were triggered by a low pressure system on the 4th June which delivered in excess of 150 mm over 24 hours, the first suitable rainfall event since weather monitoring began in October 2015 following the commencement of clearing works in July 2015.

The sampling regime was consistent with the Threatened Frog Management Plan (RMS 2015) in that breeding or calling surveys were undertaken during a period of intense rainfall and this was followed up by a series of post breeding surveys of the flooded ponds some 50 days later to determine the overall successful of the breeding event. During the field surveys, checks as to the presence of temporary frog fencing was performed and notes taken with regard to its integrity and extent relevant to the Threatened Frog Management Plan.

Green-thighed Frogs were recorded at 4 (40%) of the 10 sites and specifically at Site 3B, 4B, 5A and 5B. No calling frogs were heard and all frogs seen were adult females with count sizes in the order 1-2 individuals. The post breeding surveys performed in mid-July similarly found no Green-thighed Frog tadpoles nor froglets. The implications of the findings and how these compare with performance measures outlined in the Threatened Mammal Management Plan (RMS 2015) are discussed.

Detailed results can be found in the Year 1 Green-thighed Frog Monitoring Report for Sections 1 and 2.

Giant-barred Frog

Monitoring was undertaken in accordance with the Threatened Frog Management Plan over the compliance reporting period. A summary of this monitoring for Sections 1 and 2 (Woolgoolga to Glenugie) is as follows:

Giant Barred Frogs were recorded at 5 (62.5%) of the 8 sites and specifically at Site 1A (Corindi Creek), 1B (Madmans Creek), 2A (Dirty Creek), 3A (Halfway Creek) and 3B (Yellow Cutting Road; Figure 3-1). Frogs were not recorded from the reference Site 2B (Pigeon Gully), or from either of the Site 4 treatments (Boneys Creek and McPhillips Road; Table 3-1).

Sampling recorded 35 frogs with:

- 10 frogs recorded from Corindi Creek (Site 1A);
- Nine frogs from Madmans Creek (Site 1B);
- Five frogs from Dirty Creek (Site 2A);
- Eight frogs from Halfway Creek (Site 3A); and
- Three frogs from Yellow Cutting Road (Site 3B).

In accordance with recommendations outlined in the baseline surveys, captured frogs were microchipped or alternatively toe-clipped for individual verification during later sampling. On two occasions at Corindi Creek, frogs were photographed as opposed to being toe clipped or PIT tagged as a means of managing animal welfare (i.e. no antiseptic available). Twenty-three frogs were micro-chipped, nine were toe-clipped and a further two were photographed to enable individual verification during subsequent monitoring events. One frog eluded marking at Dirty Creek.

Detailed results can be found in the Year 1 Giant Barred Frog Monitoring Report for Sections 1 and 2.

Threatened Glider Monitoring

Threatened glider monitoring occurred throughout the reporting period in accordance with the Threatened Glider Management Plan. The results of these monitoring events will be available in the Annual Threatened Glider Monitoring report and a summary provided in the 4th compliance tracking report.

Microbat Monitoring

Microbat monitoring was undertaken in accordance with the Microbat Management Plan. A summary of the finding is as follows:

Microbats were detected on only one occasion during inspection of excluded drainage structures (Table 1). A single little bentwing bat (Miniopterus australis) was recorded during the autumn inspection, roosting within a 150mm wide/350mm deep gap in the obvert between the end unit and outlet headwall of culvert #46.

Seasonal inspections of excluded and non-excluded drainage structures along the W2HC Pacific Highway upgrade during 2016 have confirmed the effectiveness of exclusion measures in preventing microbat roost re-establishment. At the time of roost exclusion in May 2015, up to 110 little bentwing bats were roosting in drainage structure #49 (medium conservation habitat value) and up to 10 little bentwing bats were roosting in structure #46 (high conservation habitat value). Moreover, 478 little bentwing bats were recorded within structure #46 and large guano piles reported within structure #49 in July 2014 (Geolink 2014). During the four inspections carried out in 2016 only a single little bentwing bat was detected roosting within either excluded culvert.

In-situ Threatened Flora Monitoring

Monitoring of in situ threatened flora was undertaken in accordance with the threatened flora management plan. A summary of the findings is as follows.

Baseline data was available for 35 sites and a further site has been added. Monitoring was restricted by lack of access to private property and by impacts at two sites. Visual inspections made from within the project boundary were undertaken at a number of sites where there was no access to monitoring sites on adjoining private landholdings.

Overall, a minor loss of threatened flora species and habitat was identified, as a result of impacts at two of the 35 sites associated with construction. These impacts arose when the project design was modified after the monitoring had been designed and quadrats set up. The monitoring layout was not altered to accommodate the changes to the project design, so that some quadrats originally set up on lands adjacent to the corridor became part of the works footprint.

Where comparison of baseline and monitoring data was possible, it was difficult to quantify changes in abundance since different observers had undertaken surveys in 2014 and 2016, seasonal factors confounded comparisons (including high water levels in aquatic species habitat) and the boundaries of some quadrats could not confidently be re-located. It was, however, possible to identify additional impacts on habitat due to changes in hydrology and short-term sedimentation.

Observations of threatened species and habitat on adjoining lands from within the project boundary are considered useful for the detection of impacts of construction, despite the lack of relevant control plots.

Translocation

Monitoring of translocated flora was undertaken in accordance with the threatened flora management plan. A summary of the findings is as follows.

Six flora species have been translocated, or prepared for translocation on Section 1. These are:

- Hairy joint-grass *Arthraxon hispidus*

- Moonee Creek Quassia *Quassia* sp Moonee Creek.
- Noah's false chickweed *Lindernia alsinoides*
- Slender screw-fern *Lindsaea incisa*
- Square-fruited ironbark *Eucalyptus tetrapleura*
- Square-stemmed spike-rush *Eleocharis tetraquetra*

Six receiving sites have been employed to date, some with multiple species. Methods have included direct transplant (plants, soil slabs including plants and/or soil-stored propagules) and planting out of nursery raised cuttings, seedlings or grown on harvested seedlings. Monitoring locations have been established at each receiving site for each species present.

Initial translocation actions are complete for some species while intermediate steps (propagule collection and nursery production) are underway for others. Some translocations require adaptive actions.

Delays to translocation actions and a generally low survivorship of translocated plants, many of which are wetland species, were considered due to:

- a very dry summer and autumn period during 2015-16 – delays to planting, poor development of some transplants;
- delaying access to donor sites and therefore translocation into sub-optimal seasons;
- replacing seed and transplant techniques with the less reliable method of transplant of soil-stored seed and rhizomes (due to delayed access to donor sites); and
- difficulty obtaining seed from Square-fruited ironbark where bushfires had affected forest adjacent to the project
- failure of cuttings of Moonee Creek Quassia (known to be difficult to strike)

In addition, formal monitoring observations have taken place in a season which is not optimal for detecting some species e.g. Hairy joint-grass, hindering assessment of progress.

Overall, it is considered too early for formal evaluation of the translocations against targets, but planning is underway for supplementary actions where prospects for achieving targets can realistically be improved.

Environmental Complaints

During the six months reporting period, there were a total of fifteen (15) recorded complaints relating to the project. These complaints comprised of three (3) relating to dust (one of which also included a noise complaint), six (6) relating to water and five (5) relating to noise and one (1) other which related to sensitivity of primer seal from a resident.

A summary of the complaints and the responses are summarised below. All complaints are recorded into Consultation Manager and are tracked by assigning any actions to the appropriate person until they are closed out to the satisfaction of the resident. All the complaints received during the reporting period have been closed out.

- 20 May 2016: EPA phoned the project to advise that they had received a complaint from a resident regarding water levels in Corindi Creek. Environment Manager advised EPA that the project was exempt with regards to water extraction from Corindi Creek due to its significant infrastructure status. The weir near the Coral Street bridge was where the flow of Corindi Creek was measured which was checked daily before pumping commenced. The project had ceased extraction from the creek as it had been observed there was only currently a 'trickle'. It was noted that it was a particular dry period at the moment and there were other users extracting from the creek. EPA thanked the project for the advice.
- 26 May 2016: A resident adjacent to Corindi Creek called regarding water levels in the creek. The resident was advised that, as significant infrastructure, the project was allowed to pump from Corindi Creek while it was still flowing at the weir near the bridge at Coral Street. The weir was checked daily. However the project had stopped taking water from the

creek last week even though there was still a flow at the weir. EPA also was aware the project had stopped taking water and had asked the project to advise when it would start pumping again. EPA also had inspected the creek as part of the ERG meeting that week. He thanked for the response.

- 1 June 2016: Another resident adjacent to Corindi Creek called regarding water levels in the creek. The resident was advised that, as significant infrastructure, the project was allowed to pump from Corindi Creek while it was still flowing at the weir near the bridge at Coral Street. The weir was checked daily. However the project had stopped taking water from the creek last week even though there was still a flow at the weir. EPA also was aware the project had stopped taking water and had asked the project to advise when it would start pumping again. EPA also had inspected the creek as part of the ERG meeting that week. He thanked for the response.
- 8 June 2016: A resident of Halfway Creek rang regarding water and mud that they said had gone into their dam during the East Coast low rainfall event on Saturday 4 June 2016. The vicinity of the dam was inspected prior to an on-site meeting with the resident attended by the Environment Manager. The Environment Manager explained that about 330mm of rain had fallen during the event and that the site had stood up reasonably well but could not be expected to contain all that water. She explained that the vicinity of the dam had been inspected and material that had scoured had been contained adjacent to a culvert within the project boundary. She advised that the area in question would have a jute-lined drain installed to prevent further scour into rock above the dam and protect the batter above the culvert.
- 17 June 2016: A resident of Eggins Drive, Arrawarra, was contacted regarding the discharge of water from a culvert following a rain event. The resident objected to the discharge of water through a drainage line on his property and advised he had received enough water from the East Coast low rainfall event as well as rain the following weekend. He asked why the water could not be sucked out by a water truck and used elsewhere. The resident was advised that the project had basically acted as a dam or holding point for the water which would have flowed naturally through the property and that water had been tested and released through other culverts on the project. He was advised that the water would only be released as a trickle and a number of offers to meet with the Environment Manager to discuss the issue were made. The offers were refused. The resident asked if his issues could be noted and was advised they would be. He thanked for the response.
- 29 June 2016: A resident of Kangaroo Trail Road, Corindi Beach, rang regarding four semi-trailers that had driven into the local road about midnight, disturbing their sleep, which had parked up on the western side of the overpass bridge. The Community Manager apologised for the sleep disturbance and advised the trucks had driven from Newcastle with bridge planks and had parked up for the night before unloading the next morning. She advised that delivery drivers in future would be advised to park up elsewhere eg at the rest area or in truck parking bays on the Sapphire to Woolgoolga project. The resident thanked for the response.
- 4 July 2016: A resident of Kangaroo Trail Road, Corindi Beach, sent an email regarding dust and advised they did not care about the environmental limits set in the Environment Protection License. The resident was advised that the results of the dust deposition gauge on their property was the measure used to determine if dust mitigation measures needed to be ramped up. They were advised that the gauge had been compliant since installation in 2015 and had averaged a reading of 1.7g/m2/month, which was below the 4g/m2/month limit set by the project's EPL. The resident also was advised that the project would continue to send them the monthly gauge results and that the most recent results would soon be available. The resident thanked for the advice.
- 26 July 2016: A resident of Kangaroo Trail Road, Corindi Beach, rang regarding trucks again coming into Kangaroo Trail Road overnight and parking up. Community Manager apologised for the sleep disturbance and advised that the trucks belonged to the trucking

company which had previously delivered planks for the bridges overnight and caused a complaint. The company had been advised to tell its drivers to park elsewhere. The direction had been adhered to on two occasions since the first complaint but for some reason the direction had not been complied with this time. Community Manager advised that this was the last delivery for the structures team from this company. The resident thanked for the advice.

- 14 September 2016: EPA contacted the Environment Manager to advise that a complaint had come through on the EPA Pollution Hotline regarding concerns of a mulch stockpile leaching tannins affecting surrounding native vegetation. The cause of the vegetation dieback was investigated. Water samples were collected from the stockpile sump and downstream drainage line. Soil samples were taken from the affected areas and non-affected areas including a sample of the stockpiled mulch for testing. Leaves of affected trees were collected to be analysed by CSIRO to provide further information. Professional advice from the project arborist and ecologist also was sought to assist to determine the source of dieback. The project also increased and lined the stockpile perimeter bund as extra contingency, including excavating another sump. Results found that water logging had resulted in the dieback from two East Coast low events. EPA was duly advised and thanked for the information.
- 15 September 2016: A resident of Kangaroo Trail Road, Corindi Beach, rang regarding dust, and noise from unsecured tailgates banging on truck and dogs travelling east on the road to the highway. The Community Manager drove to the water tower opposite the residence and parked up for about 40 minutes to observe the haulage vehicles. It had been raining and no dust was observed. The tailgates of the haulage vehicles that travelled past also were secured. It was observed that there was minor mud-tracking from Taylors Run onto the road and the Environment Manager arranged a sweeper. 'Banging' noise also was noted on the western side of the bridge from the empty bins of the haulage vehicles due to the rough road surface. This information was relayed to the resident who thanked for the response. The sweeper however was cancelled due to more rain in the afternoon.
- 22 September 2016: A resident of Kangaroo Trail, Corindi Beach, rang regarding truck and dogs making deliveries to the batch plant at 6.15am. Community Manager spoke to the paving team and advised that this could not occur. Resident was advised that instruction had been given to ensure truck and dogs only made deliveries between 7am and 6pm. Resident thanked for the response.
- 23 September 2016: A resident of Kangaroo Trail Road, Corindi Beach, rang regarding primer seal being used near their residence and that advice had not been provided to them re the same. Community Manager apologised to the resident and advised that the paving team had not provided advice that this would occur. She advised that she had sent out an email to the team, reminding them that she needed to be advised when bitumen would be used because of the resident's sensitivity. She also advised that, previously, this advice had been provided to the resident on every other occasion. The resident acknowledged this and thanked for the response.
- 29 September 2016: A resident of Kangaroo Trail Road, Corindi Beach, rang EPA regarding sawcutting that had occurred overnight who then contacted the Environment Manager. All residents of Kangaroo Trail Road had been advised of the sawcutting between 6pm and 6am. The resident also rang the Community Manager to say that they had been woken at 3am by the activity and could not understand why the work had only started then. The CM advised that the sawcutting had not just started at 3am, that it had started from 6pm. She advised that, since sawcutting also was planned for that night and also 30 September 2016, the project offered to relocate the resident as well as their three visitors. The offer was accepted however the resident complained that meals were not included in the offer. The Community Manager explained that only accommodation was offered since the issue was sleep disturbance. The resident rang back later and thanked for the provision of the accommodation for them as well as their three visitors.

- 24 October 2016: A resident of Kangaroo Trail Road, Corindi Beach, rang regarding the noise from the large number of trucks going in and out of the road. She asked why access to and from the paver for trucks could not be provided by another road from somewhere else off the highway. Community Manager advised that the increase in the number of trucks when the batch plant was operating had previously been discussed with them and that access to the batch plant currently unfortunately was only via Taylors Run and therefore Kangaroo Trail Road. She advised however that discussions were being held regarding getting trucks through the alignment and they would be advised of the outcome. The resident thanked for the information.
- 9 November 2016: Costa Berries HR Manager asked the Community Manager to check if the water carts were still undertaking appropriate dust suppression as an office worker had noticed dust coming in through their window. Community Manager advised water carts were running through the alignment on a regular basis but that the nearby rock crushing operation was most likely the cause. It had been shut down for a period on 7 November 2016 and again on 8 November 2016 due to strong winds. The crushing operation would continue to be monitored. The Costa manager thanked for the response.

Community consultation activities from May 2016 to November 2016.

A number of consultation activities were undertaken with local businesses and residents for controlled blasting activities, project construction updates and upcoming traffic switches.

Feedback about the project from the local community has generally been very positive.

Appendix A - Compliance tables

COMPLIANCE TRACKING - MCoA Part A

Ministers Condition Of Approval	Requirement	Timing	Responsibility	Comment
A1	In addition to meeting the specific performance criteria established under this approval, the Applicant shall implement all feasible and reasonable measures to prevent and/or minimise any harm to the environment that may result from the construction or operation of the SSI.	Pre-construction Construction Operation	Pacific Complete	This is addressed within the contract documents eg. CEMP/sub plans, design drawings specifications etc.
A2	The Applicant shall carry out the SSI generally in accordance with the: (a) State significant infrastructure application SSI-4963; (b) Pacific Highway Upgrade Woolgoolga to Ballina Environmental Impact Statement Volumes 1A, 1B, 2, 3, 4A, 4B, 5, 6A, 6B, 6C, 7A, 7B and 8, prepared by Roads and Maritime Services, dated December 2012; (c) Pacific Highway Upgrade Woolgoolga to Ballina Submissions/Preferred Infrastructure Report Main Volume and Appendices, prepared by Roads and Maritime Services, dated November 2013; (d) Ancillary facility sites listed in Woolgoolga to Ballina Pacific Highway Upgrade - Ancillary descriptions and impact assessment, prepared by Roads and Maritime Services, dated 13 December 2013; (e) Connectivity structures listed in Woolgoolga to Ballina Alliance Update 20 Feb 2014 Structures Inventory (except Sections 1 and 2) and Woolgoolga to Glenugie Fauna Connectivity Tracking Register 11/02/2014, prepared by Roads and Maritime Services, and email correspondence from Roads and Maritime Services dated 14 March 2013; (f) Pacific Highway Upgrade Woolgoolga to Ballina: Utilities impact native vegetation (D00395_0102_Utilities Clearing Vegetation_v9), prepared by Roads and Maritime Services, dated 21 May 2014, (g) Modification request and letter dated 17 November 2014 to modify the definition of construction under subclause f in relation to section 4 utility adjustments and replacement of all references to OEH with EPA; (h)Modification request and letter dated 24 September 2015 to modify the approval to capture additional works outside the project boundary that may impact on heritage items to require archaeological investigations; and (i) conditions of this approval.	Pre-construction Detailed Design Construction Operation	Pacific Complete	Part (e) of this condition does not apply to Sections 1 and 2, however part (e) applies to Sections 1 and 2 of the project with regard to the document Woolgoolga to Glenugie Fauna Connectivity Tracking Register 11/02/2014.
A3	If there is any inconsistency between the above documents, the more recent document shall prevail to the extent of the inconsistency. However, the conditions of this approval shall prevail to the extent of any inconsistency.	Pre-construction Construction Operation	Pacific Complete	Noted
A4	The Applicant shall comply with any reasonable requirement(s) of the Secretary arising from the Department of Planning and Environment's assessment of: (a) any strategies, plans, programs, reviews, audits. reports or correspondence that are submitted in accordance with this approval; and (b) the implementation of any actions or measures contained in these documents.	Pre-construction Construction Operation	RMS Pacific Complete	Noted
A5	This approval shall lapse 10 years after the date on which it is granted, unless the works the subject of this SSI approval are physically commenced on or before that date.	Pre-construction	RMS	The project has physically commenced.
A6	The Applicant shall ensure that all licences, permits and approvals are obtained as required by law and maintained as required throughout the life of the SSI. No condition of this approval removes the obligation for the Applicant to obtain, renew or comply with such licences, permits or approvals.	Pre-construction Construction Operation	RMS	Licences/Permits have been obtained for the EPL, water use and State Forest occupation permits and further licences/ permits will be applied for as construction proceeds. The project obtained approval from the Department of Crown Lands and Coffs Harbour City Council to extract water from the Corindi Dam in November including a variation to the premise boundary . The Project EPL 20590 Annual Return was submitted to EPA in July 2016 as required under EPL Condition R1.
A7	The Applicant may elect to construct and/or operate the SSI in stages. Where staging is proposed, the Applicant shall submit a Staging Report to the Secretary prior to the commencement of each proposed stage. The Staging Report shall provide details of: (a) how the SSI would be staged, including general details of work activities associated with each stage and the general timing of when each stage would commence; and (b) details of the relevant conditions of approval, which would apply to each stage and how these shall be complied with across and between the stages of the SSI. Where staging of the SSI is proposed, these conditions of approval are only required to be complied with at the relevant time and to the extent that they are relevant to the specific stage(s).	Pre-construction	Pacific Complete	The Stage 1 Woolgoolga to Ballina Staging Report dated March 2015 was acknowledged by the Secretary on 30/04/2015.
A8	The Applicant shall ensure that any strategy, plan, program or other document required by the conditions of this approval and relevant to each stage (as identified in the Staging Report) is submitted to the Secretary no later than one month prior to the commencement of the relevant stage(s), unless otherwise agreed by the Secretary. Notes: • While any strategy, plan or program may be submitted on a progressive basis, the Applicant will need to ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times; and • If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program shall clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program.	Pre-construction	RMS	Noted. No further stage proposed for Section 1 at this time.
A9	The Applicant shall ensure that employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.	Pre-construction Construction Operation	Pacific Complete	This is addressed within the contract documents eg. CEMP/sub plans, design drawings, Specifications, contractors training /induction packages and also in documents such as EWMS's and Blast MP.
A10	The Applicant shall be responsible for environmental impacts resulting from the actions of all persons that it invites onto the site, including contractors, sub-contractors and visitors.	Construction	Pacific Complete	This is addressed within the contract documents eg. CEMP/sub plans, EWMS, ESCPlans, specifications, contractors training /inductions toolboxes, daily prestarts, etc.
A11	In the event of a dispute between the Applicant and a public authority, in relation to an applicable requirement in this approval or relevant matter relating to the SSI, either party may refer the matter to the Secretary for resolution. The Secretary's determination of any such dispute shall be final and binding on the parties.	Construction	Pacific Complete	Noted
A12	The Applicant shall notify the Secretary and relevant public authorities of any incident with actual or potential significant off-site impacts on people or the biophysical environment within 24 hours of becoming aware of the incident. The Applicant shall provide full written details of the incident to the Secretary within seven days of the date on which the incident occurred. Note: • Where an incident also requires reporting to the EPA and/or OEH, the incident report prepared for the purposes of notifying the EPA and/or OEH would meet this requirement.	Construction Operation	Pacific Complete Contractors	This is addressed in RMS Specification G36 Clause 3.10, 4.14 Also addressed in the contractors CEMP and RMS environmental incident classification and reporting procedure.
A13	The Applicant shall meet the requirements of the Secretary or relevant public authority (as determined by the Secretary) to address the cause or impact of any incident, as it relates to this approval, reported in accordance with condition A12, within such period as the Secretary may require.	Construction Operation	Pacific Complete Contractors	Noted.

COMPLIANCE TRACKING - MCoA Part B

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
B1	The clearing of native vegetation shall be minimised with the objective of reducing impacts to any threatened species or EECs where feasible and reasonable, consistent with the following: (a) clearing of native vegetation shall be limited to a total area of 931.7 hectares, within the SSI boundary defined in the document referred to in condition A2(c), subject to condition B1(b); (b) clearing of native vegetation for ancillary facilities specified in the document referred to in condition A2(d) and outside the SSI boundary defined in the document referred to in condition A2(c) shall be limited to 4.75 hectares; (c) clearing of threatened ecological communities shall be limited to the areas specified in Table 6-1 (under the column titled: Revised—direct impact (hectares)) of Appendix J of the document referred to in condition A2(c), subject to condition B1(d); (d) clearing of the Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions shall be limited to a total area of 0.5 hectares; and (e) clearing of Koala (Phascolarctos cinereus) primary and secondary habitat shall be limited to a total area of 375 hectares.	All	All	Pre-construction Detailed Design	Pacific Complete Detailed Designers Contractors	RMS and the Contractor will ensure compliance with the approved clearing limits under the Planning Approval. Clearing of native vegetation has been minimised with a detailed design objective being to reduce impacts to any threatened species or EECs where feasible and reasonable. Clearing limits are clearly shown on relevant construction drawings and closely tracked throughout the project. Clearing limits may change slightly with more detailed assessment. Clearing has been completed on Section 1. Minor changes have been required with minor design changes including fauna pole anchor blocks, hazardous trees, and operational basin pipework. Not all clauses of this condition will apply to each stage. An assessment will be made as to the applicability of specific clauses prior to construction. Clearing has been previously reduced in some part of the project from the clearing limit as per detailed design, including Hawthorn Close.
B2	Where feasible and reasonable, remnant vegetation shall be retained between the SSI boundary and the SSI footprint.	All	All	Pre-construction Detailed Design	Pacific Complete Detailed Designers Contractors	Vegetation clearing limits have been defined during detailed design for Stage 1-4. Roads and Maritime is satisfied that this condition has been met. Clearing has been closely monitored throughout construction.
B3	Native vegetation shall be established in or adjacent to disturbed areas within the SSI boundary to provide habitat for wildlife following the completion of construction in the vicinity of the disturbed area, consistent with the Urban Design and Landscape Plan required under condition D20.	All	All	Construction	Pacific Complete Detailed Designers Contractors	Measures for native vegetation are included in the UDLP. Progressive rehabilitation / stabilisation has been initiated on Section 1 and will continue throughout construction and into the operation phase
B4	Light spill from the SSI shall be avoided on Pink Underwing Moth and Atlas Rainforest Ground Beetle habitat, where feasible and reasonable.	10	Stage 2	Detailed Design Construction	Pacific Complete Detailed Designers Contractors	Stage 2
B5	Prior to construction, pre clearing surveys and inspections for endangered and threatened species shall be undertaken. The surveys and inspections, and any subsequent relocation of species, shall be undertaken under the guidance of a suitably qualified ecologist and shall be in accordance with the methodology incorporated into the approved Construction Flora and Fauna Management Plan. All clearing of Koala habitat trees shall be undertaken in the presence of a Koala spotter.	All	All	Pre-construction	Pacific Complete Contractors	Suitably Qualified Ecologist engaged by the Contractor has been present prior to commencement of all clearing in any area to complete inspections and complete checklist and also during clearing of any habitat trees in accordance with the Construction Flora and Fauna Management Plan. All clearing has been undertaken under the guidance of a suitably qualified ecologist, engaged by the project. All koala habitat trees have been cleared in the presence of an ecologist. All clearing activities are in line with the approved Clearing and Grubbing EWMS which was reviewed and approved by the relevant agencies.
B6	Incidental or unanticipated threatened flora and fauna finds shall be immediately reported and clearing work stopped in the vicinity of the find to allow for an evaluation of an appropriate response in accordance with the Construction Flora and Fauna Management Plan.	All	All	Pre-construction	Pacific Complete/ Contractors	Whilst not previously recorded, the project ecologist identified *Eucalyptus tetrapleura* during the clearing phase the western side of the existing highway approx Ch 9800 in Section 1. An exclusion area was established and the seeds were collected for propagation and future translocated following consultation with the ERG. This unexpected find was commended by EPA. Three (3) threatened spotted young quolls was captured by the OHLY during November 2016 followed the mother and young quoll been hit by existing highway traffic. The young quolls were cared for by the Currumbin Wildife Sanctuary and were released in December 2016 in consultation with EPA, NPWS and RMS.
B7	High risk construction activities in known Oxleyan Pygmy Perch habitat shall not be undertaken during the Oxleyan Pygmy Perch spawning period, or on days when the relevant Bureau of Meteorology site predicts a 90% chance of 10mm of rain or more, unless otherwise agreed by DPI (Fisheries).	6, 7, 8, 9	Stage 2	Construction	Pacific Complete/ Contractors	Stage 2
B8	Temporary bridge or arch structures in known Oxleyan Pygmy Perch habitat shall be used if the crossing is intended to be in place for more than 3 months.	6, 7, 8, 9	Stage 2	Construction	Pacific Complete/Contractors	Stage 2
B9	Where temporary crossings in known Oxleyan Pygmy Perch habitat are proposed with culverts or pipes, the Applicant shall, in consultation with DPI (Fisheries): (a) determine the size of the culverts or pipes to facilitate fish passage; and (b) identify the minimum size of clean rock to be used to ensure that rock material will not wash into the waterway in periods of high flows. Temporary culvert or pipe crossings shall be removed prior to the start of the Oxleyan Pygmy Perch spawning period.	6, 7, 8, 9	Stage 2	Pre-construction Construction	Pacific Complete/Contractors	Stage 2
B10	Subject to conditions B11 and B12, the Applicant shall revise the Connectivity Strategy identified in the documents listed in condition A2(e), based on the outcomes of the Mitigation Framework required by condition D1. Note: • The requirements for the Connectivity Strategy are contained in condition D2.	All	All	Pre-construction Detailed Design	Pacific Complete	Connectivity Strategy for Sections 1 & 2 was approved by DP&E on **11/5/15**
B11	As part of detailed design, the Applicant shall further investigate design refinements for fauna crossings and associated exclusionary measures, between station 41.500 and station 80.000 to improve connectivity for the Coastal Emu, and in the proximity of station 96.000 and between station 137.800 and station 159.700 to improve connectivity for the Koala. Any changes to fauna crossings and exclusionary measures shall be included in the Connectivity Strategy required under condition D2.	3,4, 5, 9, 10, 11	Stage 2	Pre-construction Detailed Design	Pacific Complete/Detailed Designers	Stage 2
B12	Investigations into the location and design of connectivity structures, including but not limited to those identified in the documents listed under conditions A2(c) and A2(e), shall be undertaken during detailed design with the input of a suitably qualified and experienced ecologist. The investigations shall be undertaken in consultation with the OEH, DPI (Fisheries) and DoE and include workshops and on-site ground verification. The results of these investigations shall be detailed in the Connectivity Strategy required under condition D2.	All	All	Pre-construction Detailed Design	Pacific Complete/Detailed Designers	Connectivity Strategy approved by DP&E on **11/5/15.** Required structures will be installed as per the Connectivity Strategy, if any issues are identified with structures during construction phase then consultation would be undertaken with the EPA and the ER to determine appropriate course of action.
B13	The Applicant shall minimise riparian vegetation clearing during construction and undertake a targeted rehabilitation program post construction to restore in-stream and riparian habitat to at least the pre-construction condition or better, unless otherwise agreed by DPI (Fisheries). All areas disturbed by the SSI that are in the vicinity of known Oxleyan Pygmy Perch habitat waterways shall be stabilised prior to the Oxleyan Pygmy Perch spawning period.	All	All	Pre-construction Detailed Design Construction Operation	Pacific Complete/Detailed Designers/Contractors	Clearing was reduced in some part of the project from the clearing limit , which is a positive outcome for the project, and this includes EECs and threatened species. Not applicable to known Oxleyan Pygmy Perch habitat on Sections 1 & 2.

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
B14	The SSI shall be constructed with the aim of achieving the construction noise management levels detailed in the Interim Construction Noise Guideline (DECC, 2009). All feasible and reasonable noise mitigation measures shall be implemented and any activities that could exceed the construction noise management levels shall be identified and managed in accordance with the Construction Noise and Vibration Management Plan. Note: • The Interim Construction Noise Guideline identifies 'particularly annoying' activities that require the addition of 5dB(A) to the predicted level before comparing to the construction Noise Management Level.	All	All	Construction	Pacific Complete/Contractors	The NVMP for the Section 1 has been approved by DPE.
B15	Construction activities associated with the SSI shall be undertaken during the following standard construction hours: (a) 7:00am to 6:00pm Monday to Friday, inclusive; and (b) 8:00am to 5:00pm Saturday; and (c) at no time on Sunday or public holidays.	All	All	Construction	Pacific Complete/Contractors	Addressed in the approved NVMP/ App D Out of Hours Work. Extended hours of work have been allowed in strategic locations and discussed with adjacent residents, EPA and the ERG. Refer to MCoA B16 below for details.
B16	Construction works outside the standard construction hours may be undertaken in the following circumstances: (a) construction works that generate noise that is: (I) no more than 5 dB(A) above rating background level at any residence in accordance with the Interim Construction Noise Guideline (DECC, 2009); and (ii) no more than the noise management levels specified in Table 3 of the Interim Construction Noise Guideline (DECC 2009) at other sensitive receivers; or (b) for the delivery of materials required outside the standard construction hours by the NSW Police Force or other authorities for safety reasons; or (c) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; or (d) between 6.00am and 7.00am and 6.00pm and 7.00pm Monday to Friday (except public holidays) in sparsely populated areas (these construction hours may be reviewed and/or revoked by the Secretary in consultation with the EPA in the case of unresolved noise complaints); or (e) low noise impact activities and work between: (i) 6.00am and 7.00am Monday to Friday; and/or (ii) 6.00pm and 7.00pm Monday to Friday; or (f) works approved through an EPL; or (g) works approved by a Construction Environment Management Plan or Construction Noise and Vibration Management Plan for the SSI.	All	All	Construction	Pacific Complete/Contractors	Addressed in the approved NVMP/ App D Out of Hours Work. Extended work hours have been approved at Section 1 (W2HC) in accordance with the NVMP/ App D Out of Hours Work Procedure which implements the Conditions of MCoA B16 and EPL 20590 out of hours, in particular B16 (d) and (e) and EPL L5.2 and L5.3. No complaints have been received regarding the approved extended hours up to 19 November 2016, since project commencement.
B17	Construction activities which cannot be undertaken during the standard construction hours for technical or other justifiable reasons (Out of Hours work) may be permitted outside the standard construction hours with the approval of the Environmental Representative. Out of Hours work shall be undertaken in accordance with an approved Construction Environment Management Plan or Construction Noise and Vibration Management Plan for the SSI, where that plan provides a process for the consideration of Out of Hours work. This consideration includes: (a) process for obtaining the Environmental Representative's approval for Out of Hours work; (b) details of the nature and need for activities to be conducted during the varied construction hours; (c) justifies the varied construction hours in accordance with the Interim Construction Noise Guideline (DECC, 2009); (d) provides evidence that consultation with potentially affected receivers and notification of the relevant council has been undertaken, that the issues raised have been addressed and all feasible and reasonable mitigation measures have been put in place; and (e) provides evidence of consultation with the EPA on the proposed variation in standard construction hours.	All	All	Construction	Pacific Complete/Contractors	Addressed in the approved NVMP/ App D Out of Hours Work. Multiple Out of Hours Work permits have been issued, inculding works for paving and batch plant operations. Respite has been offered and accepted by a sensitive reciever on Kangaroo Trail Road as part of the extended hours for these activities.
B18	Construction activities resulting in impulsive or tonal noise emission (such as rock breaking, rock hammering, pile driving) shall only be undertaken: (a) between the hours of 8:00am to 5:00pm Monday to Friday; (b) between the hours of 8:00am to 1:00pm Saturday; and (c) in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block. For the purposes of this condition 'continuous' includes any period during which there is less than a one hour respite between ceasing and recommencing any of the work the subject of this condition. The works subject to this condition may be undertaken in sparsely populated areas within the standard construction hours.	All	All	Construction	Pacific Complete/Contractors	Addressed in the approved NVMP/ App D Out of Hours Work
B19	The Applicant shall, where feasible and reasonable, limit high noise impact activities and work to the mid-morning and mid-afternoon periods, except in sparsely populated areas.	All	All	Construction	Pacific Complete/Contractors	Addressed in the approved NVMP/ App D Out of Hours Work. Blasting has been restricted to these hours as per the Blast MP. Production blasting has been completed on the project.
B20	The SSI shall be constructed with the aim of achieving the following construction vibration goals: (a) for structural damage to heritage structures, the vibration limits set out in the German Standard DIN 4150-3: Structural Vibration – Part 3 Effects of vibration on structures; (b) for damage to other buildings and/or structures, the vibration limits set out in the British Standard BS 7385-1:1990 – Evaluation and measurement of vibration in buildings—Guide for measurement of vibration and evaluation of their effects on buildings (and referenced in Australian Standard 2187.2 – 2006 Explosives – Storage and use – Use of explosives); and (c) for human exposure, the acceptable vibration values set out in Assessing Vibration: A Technical Guideline (Department of Environment and Conservation, 2006).	All	All	Construction	Pacific Complete/Contractors	Addressed in the approved NVMP.
B21	Blasting associated with the SSI shall only be undertaken during the following hours: (a) 9:00am to 5:00pm, Monday to Friday, inclusive; (b) 9:00am to 1:00pm on Saturday; and (c) at no time on Sunday or public holidays. Blasting outside the above hours and in accordance with the standard construction hours where: (i) no sensitive receivers in sparsely populated areas would be impacted by blasting; or (ii) an agreement has been made with receivers within 200 metres of the blast zone to permit blasting in accordance with the standard construction hours. This condition does not apply in the event of a direction from the NSW Police Force or other relevant authority for safety or emergency reasons to avoid loss of life, property loss and/or to prevent environmental harm.	All	All	Construction	Pacific Complete/Contractors	Addressed in the approved NVMP. Also addressed in the Blast MP, which has been approved by RMS. All blasts comply with the specified time restrictions. The currently approved blasting & vibration limits are 125dB blast overpressure and 25mm/s peak particle velocity, with no exceedances recorded to date. No complaints have been recieved regarding blasting.
B22	The Applicant shall ensure that Air blast overpressure generated by blasting associated with the SSI shall not exceed the criteria specified in Table 1 when measured at the most affected residence or other sensitive receiver. Note • a sensitive site includes houses and low rise residential buildings, theatres, schools and other similar buildings occupied by people.	All	All	Construction	Pacific Complete/Contractors	Addressed in the approved NVMP. Also addressed in the Blast MP, which has been approved by RMS. Blast Monitoring confirms that Air Blast Overpressure has complied with the specified limits for all blasts at the nearest residence/sensitive receiver. Monitoring results are reported at monthly ERG meetings & EPL monthly reporting. No concerns have been raised.

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
B23	The Applicant shall ensure that Ground vibration generated by blasting associated with the SSI shall not exceed the criteria specified in Table 2 and Table 3 when measured at the most affected residence or other sensitive receiver. Note • a sensitive site includes houses and low rise residential buildings, theatres, schools and other similar buildings occupied by people.	All	All	Construction	Pacific Complete/Contractors	Addressed in approved NVMP. Also addressed in the Blast MP, which has been approved by RMS. Blast Monitoring confirms there have been no exceedances in accordance with the project EPL 20590.
B24	The blasting criteria specified in conditions B22 and/or B23 may be increased where the Applicant has obtained the written agreement of the relevant landowner to increase the criteria. In obtaining the agreement the Applicant shall make available to the landowner: (a) details of the proposed blasting program and justification for the proposed increase to blasting criteria including alternatives considered (where relevant); (b) the environmental impacts of the increased blast limits on the surrounding environment and most affected residences or other sensitive receivers including, but not limited to noise, vibration and air quality and any risk to surrounding utilities, services or other structures; and (c) the blast management and mitigation measures, and the procedures to be implemented to monitor blasting impacts. The Applicant shall provide a copy of the written agreement to the Secretary and the EPA, including details of the consultation undertaken (with clear identification of proposed blast limits and potential property impacts) prior to commencing blasting at the increased limits. Unless otherwise agreed by the Secretary, the following exclusions apply to the application of this condition: (a) Any agreements reached may be terminated by the landowner at any time should concerns about the increased blasting limits be unresolved. Should an agreement be terminated by a landowner, the Applicant shall not exceed the criteria specified in conditions B22 and/or B23 for future blasting at that receiver. (b) The blasting limit agreed to under any agreement for an occupied residential building can at no time exceed a maximum Peak Particle Velocity vibration level of 25 mm/s or maximum Air blast Overpressure level of 125 dBL.	All	All	Construction	Pacific Complete/Contractors	Addressed in approved NVMP. Also addressed in the Blast MP, which has been approved by RMS. The currently approved blasting & vibration limits are 125dB blast overpressure and 25mm/s peak particle velocity.
B25	Wherever feasible and reasonable, piling activities shall be undertaken using quieter construction methods, such as bored piles or vibrated piles rather than impact or percussion piling methods.	All	All	Construction	Pacific Complete/Contractors	Only bored piles were used on the project including the use of polymer which removes the need for any driving or vibrating piles.
B26	Prior to the use of the dynamic compaction construction method, the Applicant shall undertake an assessment of vibration generated by dynamic compaction on nearby sensitive receivers. Feasible and reasonable mitigation measures shall be implemented to minimise vibration impacts.	All	All	Construction	Pacific Complete/Contractors	Assessment has been completed and included in the CNVMP
B27	During construction, affected educational institutions shall be consulted and reasonable steps taken to ensure that noise generating construction works in the vicinity of affected buildings are not timetabled during examination periods where practicable, unless other reasonable arrangements to the affected institutions are made at no cost to the affected institution.	4, 5, 8, 9	Stage 2	Construction	Pacific Complete/Contractors	Stage 2
B28	The SSI shall be designed and operated with the objective of not exceeding the road noise criteria outlined in the NSW Road Noise Policy (DECCW, 2011).	All	All	Detailed Design Operation	Pacific Complete/Contractors	Operational Noise Management Report (ONMR) was submitted to DP&E and approved on 2 June 2015. Community consultation is being scheduled. Identified mitigation works will them commence following consultation on the ONMR.
B29	Where feasible and reasonable, operational noise mitigation measures shall be implemented at the start of construction (or at other times during construction) to minimise construction noise impacts.	All	All	Detailed Design Operation	Pacific Complete/Contractors	RMS is currently finalising the delivery method for noise mitigation works Identified within the Operational Noise Management Report, mitigation works will be undertaken as soon as is practicable.
B30	Except as may be expressly provided by an EPL, the Applicant shall comply with section 120 of the Protection of the Environment Operations Act 1997.	All	All	Construction	Pacific Complete/Contractors	All works are been undertaken to meet the objectives of Section 120.
B31	The hydrological and flooding impacts resulting from the SSI are to be assessed during detailed design against the 'Design Objectives for Flood Management' described in Section 2.1 of the EIS Working Paper – Hydrology and Flooding. This shall include assessment against the 'Flood Management Objectives' and the 'Other Flood Impact Considerations' as well as the other requirements of this section of the EIS. The hydrology assessment shall include the refinement of or development of new flood models (where required) for the 14 catchments investigated during the EIS. These models shall be operated for the same design floods considered in the EIS, as well as the 2000 year ARI and the probable maximum flood (PMF) design events.	All	All	Pre-construction Detailed Design	Pacific Complete/Detailed Designers	Hydrological Mitigation Report for Corindi (Section 1) was submitted for approval to DP&E on **1/05/15**. No mitigation report is required for Section 2.
B32	For the Corindi, Shark Creek and Farlows Flat areas, flooding and hydrological impacts resulting from existing highway infrastructure shall be assessed. As part of this assessment, flood models shall assess the impacts of recent highway upgrades in this area. Where the existing highway in these areas has resulted in adverse flooding and/or hydrological impacts, opportunities to reduce the quantum of these impacts shall be considered during the detailed design of the SSI, where feasible and reasonable.	1,4,5	All	Pre-construction Detailed Design	Pacific Complete/Detailed Designers	Corindi Creek is within the Section 1 project area. Farlows Flat and Shark Creek are within the Wave 1 and Wave 3 project areas. The Hydrological Mitigation Report for Corindi was submitted for approval to Dept of Planning on the **1/5/15.** As outlined in the report, RMS is undertaking community consultation on the Blackadder Safety works mitigation. This work is proposed to be undertaken following the upgrade of Section 1.
B33	Where the objectives and considerations referred to in condition B31 cannot be complied with, the Applicant shall: (a) achieve compliance through modified embankment or drainage design. This might include new or duplicated drainage structures designed to minimise afflux and other impacts to waterways that traverse the road alignment, to the greatest extent practicable; or (b) achieve an acceptable level of mitigation of impacts through alternative design measures (e.g. raised access tracks) in consultation with the affected land-owner; or (c) reach agreement with affected landowners on impacts to property.	All	All	Pre-construction Detailed Design	RMS/ Pacific Complete/Detailed Designers	Hydrological Mitigation Report for Corindi was submitted for approval to DP&E on **1/05/15**. Where the flood management objectives have not been achieved for Corindi, land -owner consent has either been granted (for property already acquired) or is being sought for those currently in acquisition. There are two temporary creek crossings remaining in place, one at Cassons Creek and one at Red Bank Northern Tributary as the permanent creek crossings are now in use or being constructed.
B34	Soil and water management measures consistent with Managing Urban Stormwater - Soils and Construction Vols 1 and 2, 4th Edition (Landcom, 2004) and Managing Urban Stormwater Soil and Construction Vols 2A and 2D Main Road Construction (Department of Environment and Climate Change, 2008) shall be employed during the construction of the SSI to minimise soil erosion and the discharge of sediment and other pollutants to land and/or water.	All	All	Detailed Design Construction	Pacific Complete/Contractors	Addressed in CEMP and SWMP, regular and updated ESCPs and inspections by the Contractor and RMS. In addition, RMS and OHLY each employ a soil conservationist to assist with soil conservation challenges on Section 1.
B35	Where available, and of appropriate chemical and biological quality, stormwater, recycled water or other water sources shall be used, where feasible and reasonable, in preference to potable water for construction activities, including concrete mixing and dust control.	All	All	Construction	Pacific Complete/Contractors	Collected site runoff in containment areas (ie turkeys nest at Cassons Creek), tannin sumps, drain water & other areas are been continuously reused on the project for dust suppresssion and construction water. Paving works have not commenced however the first flush recycled system has been installed in order to reuse alkaline water for production.
B36	All surface water and groundwater shall be adequately treated as far as is practicable, prior to entering the stormwater system to protect the receiving water source quality.	All	All	Construction	Pacific Complete/Contractors	Addressed in SWMP, ESCPs and EPL 20590.

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
B37	Prior to the commencement of site preparation and excavation activities, or as otherwise agreed by the Secretary, in areas identified as having a moderate to high risk of contamination, a site audit shall be carried out by a suitably accredited contaminated site auditor. A Site Audit Report is to be prepared by the site auditor detailing the outcomes of Phase 2 contamination investigations within these areas. The Site Audit Report shall detail, where relevant, whether the land is suitable (for the intended land use) or can be made suitable through remediation. Where the investigations identify that the site is suitable for the intended operations and that there is no need for a specific remediation strategy, measures to identify, handle and manage potential contaminated soils, materials and groundwater shall be identified in the Site Audit Report and incorporated into the Construction Environmental Management Plan. Where the investigations identify that the site is suitable for the intended operations and that a remediation strategy is required, the Site Audit Report shall include a remediation strategy for addressing the site contamination, and how the environmental and human health risks will be managed during the disturbance, remediation and/or removal of contaminated soil or groundwater, and be incorporated into the Construction Environmental Management Plan. Where remediation is required, a Site Audit Statement(s) shall be prepared verifying that the site has been remediated to a standard consistent with the intended land use. Note • Terms used in this condition have the same meaning as in the Contaminated Land Management Act 1997.	All - TBC	All	Pre-construction Construction	Pacific Complete/Contractors	Contamination investigations have not identified any moderate to high risk areas within the section 1 and 2 project areas. For Section 1, An additional area of potential contamination was investigated at properties which were demolished by contamination specialists but no ground contamination was identified, however asbestos containing material was lawfully removed and disposed of.
B38	Watercourse crossings shall be designed and constructed in consultation with the DPI (Fisheries), EPA, NOW and DoE, and where feasible and reasonable, be consistent with the Guidelines for Controlled Activities Watercourse Crossings (Department of Water and Energy, February 2008), Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull and Witheridge, 2003), Policy and Guidelines for Fish Friendly Waterway Crossings (NSW Fisheries, February 2004), and Policy and Guidelines for Fish Habitat Conservation and Management (DPI Fisheries, 2013). Where multiple cell culverts are proposed for crossings of fish habitat streams, at least one cell shall be provided for fish passage, with an invert or bed level that mimics watercourse flows.	All	All	Pre-construction Detailed Design	Pacific Complete/Detailed Designers/Contractors	Significant consultation with agencies has occurred during detailed design for permanent crossings, and will also be undertaken during construction phase by the contractor. All temporary creek crossings have been removed on Section 1 as permanent crossings are in place and operational.
B39	All crossings of known Giant Barred Frog habitat or waterways with the confirmed presence of the species shall be designed and constructed with bridges. Should the Applicant construct a crossing structure other than a bridge, the Applicant shall demonstrate maintained connectivity for the Giant Barred Frog upstream and downstream of that crossing for a monitoring period of three consecutive years, or such other period agreed by the Secretary in consultation with the OEH. Demonstration of maintained habitat connectivity shall: (a) be based on baseline data that confirms the presence, nature and distribution of Giant Barred Frog population using a survey methodology that has been endorsed by the OEH, and detailed in the Mitigation Framework required in condition D1, and an assessment of the connectivity of the crossing site prior to commencement; or, if adequate baseline data is not provided to the satisfaction of the Secretary, be based on the assumption of occurrence of a population on either side of the crossing site; and (b) be based on evidence that the Giant Barred Frog has remained present upstream and downstream of the crossing site for the monitoring period, with periodic monitoring to occur at least biannually. Should the results of any instance of periodic monitoring record an absence of the Giant Barred Frog, the Applicant shall be required to demonstrate that this change is not as a result of the SSI within one month of the completion of that instance of periodic monitoring, to the satisfaction of the Secretary. Should the Secretary not be satisfied that the change is not a result of the SSI, the SSI will be deemed as the cause of the impact and the Applicant shall offset the loss of the habitat in accordance with this approval.	1	Stage 1	Pre-construction Detailed Design		For section 1 and Section 2, this has been addressed in detailed design to avoid impact to known Giant Barred Frog habitat. Bridges at Corindi Creek are used in Giant Barred Frog habitat. A monitoring regime will be established in accordance with the requirements of B39 which will include monitoring for 3 consecutive years post construction to ensure connectivity is maintained at this location. Note, recent monitoring of culverts (2016) on the Sapphire to Woolgoolga project confirmed Giant Barred frogs making complete crossing of culvert underpass structures. The Threatened Frog Management Plan will be updated accordingly. Fourteen (14) Giant Barred Frogs were recorded during a recent targeted monitoring survey (as per the Plan) upstream and downstream of Corindi Creek.
B40	Unless otherwise agreed by DPI (Fisheries), all crossings of Class 1 watercourses in known Oxleyan Pygmy Perch habitat shall be designed and constructed with a bridge or arch structure and, where feasible and reasonable, no supporting structures shall be installed within affected waterways.	6, 7, 8, 9	Stage 2	Pre-construction Detailed Design	Pacific Complete/Detailed Designers/Contractors	Stage 2
B41	Where an Oxleyan Pygmy Perch habitat waterway is realigned or its stream profile is changed, or an in-stream structure is installed in the waterway (both permanent and temporary construction structures), the Applicant shall ensure that the final design of that waterway does not result in water velocities exceeding 0.4 metres per second under normal flow conditions. The Applicant shall determine normal flow conditions to the satisfaction of DPI (Fisheries) through baseline monitoring of known Oxleyan Pygmy Perch habitat waterways.	6, 7, 8, 9	Stage 2	Pre-construction Detailed Design	Pacific Complete/Detailed Designers	Stage 2
B42	The Applicant shall ensure that the SSI does not increase the afflux of waterways with known Oxleyan Pygmy Perch habitat by more than the relevant flood management objective in the documents referred to in condition A2 for flood events up to the 1 in 100 year event.	6, 7, 8, 9	Stage 2	Pre-construction Detailed Design	Pacific Complete/Detailed Designers/Contractors	Stage 2
B43	The Applicant shall investigate the removal of the proposed embankment at station 145.2 and its replacement with an extension of the Richmond River bridge. The investigation shall consider issues around hydrology and flooding (including meeting the flooding objectives for bridges), constructability, cost, funding arrangements and visual impacts. The investigation shall include consideration of other relevant environmental impacts (noise, heritage, biodiversity, traffic etc.) and consider any alternative options. A copy of the investigation shall be submitted to the Secretary prior to the commencement of any bridge approach or embankment works in the vicinity.	10	Stage 2	Pre-construction Detailed Design	Pacific Complete/Detailed Designers	Stage 2
B44	Prior to the commencement of construction affecting PAD site WWC Dirty Creek 1 and ancillary facilities at Section 4, Site 1; Section 4, Site 3; Section 7, Site 1; Section 10, Site 1a; and Section 11, Site 1a , the Applicant shall: (a) undertake field investigation, and where required, an archaeological investigation of the site(s) using a methodology generally consistent with testing undertaken for the Environmental Impact Statement, and prepared in consultation with the OEH (Aboriginal heritage) and the Registered Aboriginal Parties; and (b) prepare a report on the results of the archaeological investigation, including recommendations (such as further archaeological work) in consultation with the OEH and to the satisfaction of the Secretary, and shall include, but not necessarily be limited to: (i) consideration of measures to avoid or minimise disturbance to Aboriginal objects where objects of moderate to high significance are found to be present; (ii) recommendations for further investigations under condition B45 where impacts cannot be avoided; and (iii) details of management and mitigation measures to ensure there are no additional impacts due to pre-construction and construction activities; and (c) submit the report to the Registered Aboriginal Parties, the OEH (Aboriginal heritage) and the Secretary.	1, 4, 7, 10, 11	All	Pre-construction	RMS/Pacific Complete	Test excavations have been undertaken on WWC Dirty Creek 1, which was assessed as being of no archaeological potential and no archaeological significance. All PAD sites in section 1 will be cleared by the 3/7/15. All Aboriginal heritage investigations have been completed for Section 1. Any other areas identified for potential use outside the project boundary require a heritage assessment. PAD sites identified in B44 do not occur in section 2.

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
B45	Prior to the commencement of construction activities affecting Aboriginal sites WWC39, WWC46, Tyndale 2 site, IR2W4, Site 11, E2/2, WWC37, Dubaljeen site (New Italy 1), The Gap Road 1, WX21 Site 8, Site 1, Site 2, Site 3 and Site 4 and sites recommended by condition B44 for further investigation, the Applicant shall: (a) develop a detailed salvage strategy, prepared in consultation with the OEH (Aboriginal heritage) and the Registered Aboriginal Parties. The salvage strategy shall be prepared to the satisfaction of the Secretary; and (b) undertake any further archaeological excavation works recommended by the results of the detailed salvage strategy. Within twelve months of completing the above work, unless otherwise agreed by the Secretary, the Applicant shall prepare a report containing the findings of the excavations, including artefact analysis and Aboriginal Site impacts Recording Forms (ASIR), and the identification of final storage location for all Aboriginal objects recovered (testing and salvage), in consultation with the Registered Aboriginal Parties, the OEH (Aboriginal heritage) and to the satisfaction of the Secretary. The report shall be submitted to the Registered Aboriginal Parties, the OEH (Aboriginal heritage) and the Secretary. Note: • Where archaeological testing has occurred as part of the environmental assessment and the results are included in the documents listed in condition A2, the sites tested shall be included in the final report prepared under condition B45.	3, 4, 7, 8, 9, 10, 1	All	Pre-construction	RMS/Pacific Complete	Salvage strategy approved by DP&E in late August 2014. Salvage not anticipated to be completed until June 2015 for W2IR area and September 2015 for IR2W area. All Aboriginal heritage investigations have been completed for Section 1.
B46	Identified impacts to Aboriginal heritage, shall be minimised to the greatest extent practicable through both detailed design and construction, particularly with regard to the Aboriginal sites Gittoes Jali and the Melino site, and the Aboriginal culturally significant places identified as Corindi Massacres (section 1), Burials (section 1), Halfway Creek Ceremonial Site, Birrugan and Mindi spiritual sites (sections 1, 2, 5 and 10), Pillar Valley men's and women's sites, Place H, Place I and Place J. Where impacts are unavoidable, works shall be undertaken in accordance with the strategy outlined in the Construction Heritage Management Plan.	1,2, 3, 8, 9 10, 11	All	Pre-construction Detailed Design Construction	Pacific Complete/Detailed Designers/Contractors	The EA process and Detailed design has been undertaken with the objective to minimise to the greatest extent practicable impacts to Aboriginal heritage. All Aboriginal heritage investigations have been completed for Section 1. Where impacts are unavoidable in construction, works would be undertaken in accordance with the strategy outlined in the Construction Heritage Management Plan.
B47	The Applicant shall not destroy, modify or otherwise physically affect Aboriginal sites WWC5, WWC7, WWC26, WWC92, WWC115, WWC139, Tyndale 1, Scarred/engraved Tree (section 7), C3/2/2, Saw Pit Creek / New Italy, Gittoes Jali 2, Cooks Hill, Broadwater, Law PAD, Law Scarred Tree, MST 3, C21, Melino Scarred Tree 4, MST 2, MST1, Rudgley Scarred Tree or Saezza 1.	2, 4, 7, 8, 9, 10, 1	All	Pre-construction Detailed Design Construction	Pacific Complete/Detailed Designers/Contractors	These sites have been identified within the contract documents, CEMP, design packages and sensitive area plans. Also captured within training packages and inductions for contractors for Sections 3-11.
B48	Prior to the commencement of construction affecting the Convent (12-14 Rivers Street), Harwood (item 21), the Applicant shall carry out further historical research and investigate the options for relocation of the convent building, in consultation with the Department of Planning and Environment and the OEH (Heritage Division), to the satisfaction of the Secretary.	5	Stage 2	Pre-construction Detailed Design Construction	RMS/Pacific Complete	Stage 2
B49	Prior to the commencement of construction in proximity to the following heritage items: 21; 23 (Roder's well and orchard); 26; 28; 29; and 43, the Applicant shall complete all archival recordings, including photographic recording of these heritage items, unless otherwise agreed by the Secretary. The archival recording shall be undertaken by an experienced heritage consultant, in accordance with the Guidelines issued by the Heritage Council of NSW. The areas containing these items shall be clearly identified and/or fenced until the completion of the archival recordings. Within 6 months of completing the archival recording, the Applicant shall submit a report containing the archival and photographic recordings and the historical research, where required, to the Department of Planning and Environment, the Heritage Council of NSW, and the local library and the local Historical Society in the relevant local government area(s).	5, 7, 9, 10	Stage 2	Pre-construction	RMS/Pacific Complete	Stage 2
B50	Prior to construction affecting the following heritage items: 7; 23 (Roder's well and orchard) and 28, the Applicant shall carry out further historical and physical archaeological investigations of these heritage items, in consultation with the Department of Planning and Environment and the OEH (Heritage Division), to the satisfaction of the Secretary. These investigations shall: (a) include archaeological investigations and excavation in accordance with the Heritage Council's Archaeological Assessments Guideline (1996) using a methodology prepared, in consultation with the OEH (Heritage Division), and to the satisfaction of the Secretary. The archaeological investigation shall be undertaken by an archaeological heritage consultant, whose appointment has been endorsed by the Secretary. The nomination for the Excavation Director shall demonstrate ability to comply with the Heritage Council's Criteria for the Assessment of Excavation Directors (July 2011); (b) provide for the detailed analysis of any heritage items discovered during the investigations; (c) include management options for these heritage items (including options for relocation and display); and (d) if the findings of the investigations are significant, provide for the preparation and implementation of a heritage interpretation plan. Within 12 months of completing the above work, unless otherwise agreed by the Secretary, the Applicant shall prepare a report containing the findings of the excavations, including artefact analysis, and the identification of a final repository for finds, prepared in consultation with the OEH (Heritage Division) and to the satisfaction of the Secretary. The report shall be submitted to the Department of Planning and Environment, the Heritage Council of NSW, and the local library and the local Historical Society in the relevant local government area(s). Note: • Where archaeological testing has occurred as part of the environmental impact assessment for the SSI and the results are included in the documents listed in condition A2, the sites tested shall still form part of the methodology and final report prepared for the non-Aboriginal archaeological investigation program.	2, 7, 9	All	Pre-construction	RMS/Pacific Complete	NA
B51	The Applicant shall not destroy, modify or otherwise physically affect the heritage items listed in Table 5-1, Historic (non-Aboriginal) Heritage Assessment Working Paper and Table 3-38, Submissions/Preferred Infrastructure Report (RMS, November 2013).	1, 5, 7, 10	All	Pre-construction Detailed Design Construction	Pacific Complete/Detailed Designers/Contractors	For section 1, management and mitigation of these items will be addressed within the Construction Heritage Management Plan - for section 1 impact to be avoided on Tree stumps at Milleara/Halfway Creek Post office Lane stockyards, Corindi Beach is within the Section 1 project area.
B52	Identified impacts to heritage sites shall be minimised where feasible and reasonable through both detailed design and construction, particularly with regard to the historic site known as the North Coast Railway Branch Tramway, Glenugie. Where impacts are unavoidable, works shall be undertaken in accordance with the actions to manage heritage construction impacts required by condition D26(d) and under the guidance of an appropriately qualified heritage specialist.	2	Stage 1	Pre-construction Detailed Design Construction		NA
B53	This approval does not allow the Applicant to destroy, modify or otherwise physically affect human remains as part of the SSI.	All	All	Pre-construction Detailed Design Construction	Pacific Complete/Contractors	Noted. Addressed in the Construction Heritage Management Plan.
B54	The Applicant shall not destroy, modify or otherwise physically affect any heritage items outside the SSI footprint, unless otherwise agreed by the Secretary in accordance with condition B78.	All	All	Pre-construction Detailed Design Construction	Pacific Complete/Detailed Designers/Contractors	Noted. Addressed in the Construction Heritage Management Plan.
B55	The measures to protect heritage sites near or adjacent to the SSI during construction shall be detailed in the Construction Heritage Management Plan.		All	Pre-construction		Addressed in the Construction Heritage Management Plan.

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
B56	The SSI shall be designed with the objective of minimising adverse changes to existing access arrangements and services for other transport modes and, where feasible and reasonable, facilitate an improved level of access and service to other transport modes comparable to or better than the existing situation.	All	All	Pre-construction Detailed Design Construction	Pacific Complete/Contractors	This has been achieved and addressed during detailed design.
B57	Safe pedestrian and cyclist access through or around worksites shall be maintained during construction. In circumstances where pedestrian and cyclist access is restricted due to construction activities, a satisfactory alternate route shall be provided and signposted.	All	All	Pre-construction Detailed Design	Pacific Complete/Detailed Designers	Addressed via Traffic Management Plan and traffic control plans via compliance with G10 specification.
B58	Construction vehicles (including staff vehicles) associated with the SSI shall be managed to: (a) minimise parking or queuing on public roads; (b) minimise idling and queuing in local residential streets where practicable; (c) minimise the use of local roads (through residential streets and town centres) to gain access to construction sites and compounds; and (d) adhere to the nominated haulage routes identified in the Construction Traffic Management Plan.	All	All	Pre-construction Construction	Pacific Complete/Contractors	This has been achieved by providing ample parking on the construction site resulting in no parking on local roads or idling vehicles in this area. Designated parking bays have been positioned in all work areas from Eggins Road to chainage 1428 where culverts are currently been constructed for construction vehicles including workers private vehicles. These areas are demarcated using blue flagging. Where possible, the project have prioritised access through the alignment to avoid use of local roads, including staging of works to minimise disruption to public motorists. Opening up the main alignment to create a continual haul route for moxie's and dump trucks to cart material through the project to reduce truck and dog haulage on the Highway has occurred with early planning. The project VMP's are regularly updated to reflect changing traffic conditions.
B59	In relation to new or modified local road, parking, pedestrian and cycle infrastructure, the SSI shall, where feasible and reasonable, be designed: (a) in consultation with the relevant council; (b) take into consideration existing and future demand, road safety and traffic network impacts; (c) to meet relevant design, engineering and safety guidelines, including Austroads Guide to Traffic Engineering Practice; and (d) be certified by an appropriately qualified person that has considered the above matters.	All	All	Construction	Pacific Complete/Contractors	This has been achieved and addressed during detailed design.
B60	The Applicant shall ensure that the SSI is designed to minimise land take impacts to surrounding properties (including agricultural properties) as far as feasible and reasonable, in consultation with the affected landowners.	All	All	Pre-construction Detailed Design	Pacific Complete/Detailed Designers	This has been a consideration during the EA, concept design through to the detailed design and Implementation phase. The project has been able to reduce clearing at an adjacent property has assisted a local landowner.
B61	Where the viability of existing agricultural operations are identified to be impacted by the land requirements of the SSI, the Applicant shall, at the request of these landowners, employ a suitably qualified and experienced independent agricultural expert, whose appointment has been endorsed by the Secretary, to assist in identifying alternative farming opportunities for the land, including purchase of other residual land to enable existing agricultural activities to continue.	All	All	Pre-construction Detailed Design	Pacific Complete/Detailed Designers	During the consultation process for the EIS/SPIR, and as required during the acquisition process, agricultural needs have been considered and addressed by design changes and/or compensation.
B62	Unencumbered access to private property shall be maintained during construction unless otherwise agreed with the landowner in advance. A landowner's access that is physically affected by the SSI shall be reinstated to at least an equivalent standard, in consultation with the landowner.	All	All	Pre-construction	Pacific Complete/Detailed Designers	This has been achieved throughout construction and shall continued through duration of construction. No issues or complaints received from any residents.
B63	The Applicant shall, in consultation with relevant landowners, construct the SSI in a manner that minimises intrusion and disruption to agricultural operations/activities in surrounding properties (e.g. stock access, access to farm dams, etc.), unless otherwise agreed by the landowner.	All	All	Detailed Design Construction	Pacific Complete/Detailed Designers/Contractors	Impact to agricultural activities has been minimised as far as possible. During construction, the project have assisted landowners with property access and stock access.
B64	Any damage caused to property as a result of the SSI shall be rectified or the landowner compensated, within a reasonable timeframe, with the costs borne by the Applicant. This condition is not intended to limit any claims that the landowner may have against the Applicant.	All	All	Construction	Pacific Complete/Detailed Designers	No issues to date. Pre-construction building condition inspections have been completed for all structures within the zones specified within Specification G36, with post construction inspections to be completed following construction. Any identified damage will be rectified.
B65	Where the SSI traverses a state forest, the Applicant shall, in consultation with the NSW Forestry Corporation, ensure that construction does not unduly disrupt existing forestry activities, access for fire fighting and access for other activities within state forests, unless otherwise agreed by the NSW Forestry Corporation.	All	All	Construction	Pacific Complete/Contractors	There has been no disruption to State Forest activities. 4.5Ha of land has been approved by Forest Corporation by Forest Occupation Permit for construction of temporary sedimentation basins. These areas will be rehabilitated to satisfaction of Forestry Corporation as per lease conditions prior to completion of construction.
B66	The SSI shall be constructed in a manner that minimises dust emissions from the site, including wind-blown and traffic-generated dust and tracking of material onto public roads. All activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site. Should such visible dust emissions occur at any time, the Applicant shall identify and implement all feasible and reasonable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust cease.	3, 6, 7	All	Construction	Pacific Complete/Contractors	Addressed in Air Quality MP and construction mitigation measures used on site.
B67	Dangerous goods, as defined by the Australian Dangerous Goods Code, shall be stored and handled strictly in accordance with: (a) all relevant Australian Standards; (b) for liquids, a minimum bund volume requirement of 110% of the volume of the largest single stored volume, within the bund; and (c) the Environment Protection Manual for Authorised Officers: Bunding and Spill Management, technical bulletin (Environment Protection Authority, 1997). In the event of an inconsistency between the requirements listed from (a) to (c) above, the most stringent requirement shall prevail to the extent of the inconsistency.	All	All	Pre-construction Construction	Pacific Complete/Contractors	Addressed in Waste and Energy MP.
B68	Waste generated outside the site shall not be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence or waste exemption under the Protection of the Environment Operations Act 1997, if such a licence is required in relation to that waste.	All	All	Construction	Pacific Complete/Contractors	All waste managed in accordance with Construction Waste and Energy Management Plan.
B69	The reuse and/or recycling of waste materials generated on site shall be maximised as far as practicable, to minimise the need for treatment or disposal of those materials off site.	All	All	Construction	Pacific Complete/Contractors	All waste managed in accordance with Construction Waste and Energy Management Plan.
B70	All liquid and/or non-liquid waste generated on the site shall be assessed and classified in accordance with Waste Classification Guidelines (Department of Environment, Climate Change and Water, 2009).	All	All	Construction Operation	Pacific Complete/Contractors	All waste disposed of in accordance with Construction Waste and Energy Management Plan.
B71	All waste materials removed from the site shall only be directed to a waste management facility or premises lawfully permitted to accept the materials.	All	All	Construction Operation	Pacific Complete/Contractors	Waste is managed in accordance with Construction Waste and Energy Management Plan. Some waste can be beneficially reused as per POEO s143 permit in accordance with G36 4.11. The project has adopted the waste reduce, reuse and recycle principles with all construction materials.
B72	Utilities, services and other infrastructure potentially affected by construction and operation shall be identified prior to construction to determine requirements for access to, diversion, protection, and/or support. Consultation with the relevant owner and/or provider of services that are likely to be affected by the SSI shall be undertaken to make suitable arrangements for access to, diversion, protection, and/or support of the affected infrastructure as required. The cost of any such arrangements shall be borne by the Applicant.	All	All	Construction Operation	Pacific Complete/Contractors	This has been addressed during detailed design and during construction.

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
B73	The sites for ancillary facilities that are associated with the construction of the SSI and that have not been identified and assessed in the documents listed in condition A2 shall: (a) be located more than 50 metres from a waterway (100 metres for a State Environmental Planning Policy No. 14 wetland or known Oxleyan Pygmy Perch habitat waterway); (b) not impact on connectivity structures or vegetation leading to a connectivity structure; (c) be located within or adjacent to the SSI boundary; (d) have ready access to the road network; (e) be located in areas of low ecological significance and require no clearing of native vegetation; (f) be located more than 50 metres from threatened species and endangered ecological communities and their habitats; (g) be located on relatively level land; (h) be separated from the nearest residences by at least 200 metres (or at least 300 metres for a temporary batching plant) and comply with construction noise management levels at sensitive receivers; (i) be above the 20 year ARI flood level unless a contingency plan to manage flooding is prepared and implemented; (j) have minor impacts on flood storage and not result in obstruction of floodplain flow or blockage of culverts and drains; (k) not unreasonably affect the land use of adjacent properties; (l) operate in accordance with the construction hours set out in conditions B15 and B16; (m) provide sufficient area for the storage of material to minimise, to the greatest extent practical, the number of deliveries required outside standard construction hours; and (n) be located in areas of low heritage conservation significance (including areas identified as being of Aboriginal cultural value) and not impact on heritage sites beyond those already impacted by the SSI. The Applicant shall undertake an assessment of the facility against the above criteria in consultation with the relevant public authority(s) and the relevant council. The assessment shall be approved by the Environmental Representative and included in the Ancillary Facilities Management Plan required under condition D21.	All	All	Pre-construction Detailed Design	Pacific Complete/Detailed Designers	The main compound at Kangaroo Trail Road meets these requirements, similarly the concrete batch plant on Taylors Run also meets these requirements following consultation with the project archaeologist and Aboriginal representatives.
B74	Ancillary facilities that have not been previously identified and assessed in the documents listed in condition A2, and do not meet the criteria set out under condition B73, shall be approved by the Environmental Representative prior to its establishment. In obtaining this approval, the Applicant shall consult with the relevant public authority(s) and the relevant council, and demonstrate to the satisfaction of the Environmental Representative, how the potential environmental impacts can be mitigated and managed to acceptable standards. The outcomes of the assessment shall be documented in a report and include, but not necessarily be limited to: (a) details on the site location and access arrangements; (b) a description of the activities to be undertaken; (c) outcomes of the assessment of the site against the locational criteria set out in condition B73; (d) an assessment of the environmental impacts on the site and the surrounding environment, including, but not limited to noise, vibration, air quality, traffic and access during site establishment and operation, flora and fauna, heritage, erosion and sedimentation, water quality and light spill; (e) details of the mitigation, monitoring and management procedures specific to the ancillary facility that would be implemented to minimise environmental impacts; and (f) demonstrated overall consistency with the approved SSI (including impacts identified in the documents listed in condition A2). A copy of the report shall be included in the Ancillary Facilities Management Plan.	All	All	Pre-construction	Pacific Complete/ Contractors	The main compound at Kangaroo Trail Road meets these requirements, similarly the concrete batch plant on Taylors Run also meets these requirements following consultation with the project archaeologist and Aboriginal representatives.
B75	Notwithstanding condition B74, ancillary facilities that that have not been previously identified and assessed in the documents listed in condition A2 and result in additional impacts to biodiversity, heritage, flooding and noise beyond those approved for the SSI, shall be approved by the Secretary prior to their establishment. In order to obtain this approval, the Applicant shall undertake an assessment of the ancillary facility in accordance with condition B74 and forward a copy of the assessment report to the Secretary, as part of the approval submission, at least one month prior to the establishment of the facility.	All	All	Pre-construction	Pacific Complete/ Contractors	RMS sought approval from the Secretary for the extension of the Hawthorn Close Ancillary facility due to changes to an existing ancillary facility as required under MCoA B77. Also, as the proposal would result in impacts to biodiversity beyond those approved for the SSI. The extension to Hawthorn Close Ancillary Facility was approved by the Secretary.
B76	The land on which ancillary facilities are located shall be rehabilitated to at least their pre-construction condition or better, unless otherwise agreed by the landowner.	All	All	Pre-construction	Pacific Complete/ Contractors	Shall be undertaken following use of the sites in consultation with RMS or other relevant landowners
B77	Where changes are made to the boundary or use of an ancillary facility, including facilities identified in the documents listed in condition A2, the Applicant shall assess the facility against the criteria set out in condition B73. If the ancillary facility site: (a) does not meet the criteria set out under condition B73 the Applicant shall seek the approval of the Environmental Representative in accordance with condition B74; or (b) results in impacts to biodiversity, heritage, flooding and noise beyond those approved for the SSI, the Applicant shall seek the approval of the Secretary in accordance with condition B75. The relevant approval shall be obtained prior to the establishment of the ancillary facility.	All	All	Pre-construction Construction Operation	Pacific Complete/ Contractors	Not applicable to current or proposed Ancillary Facility sites.
B78	The Applicant may undertake archaeological investigations at ancillary sites that do not meet the criterion set out in condition B73, where this is required to assess the potential Aboriginal and non-Aboriginal archaeological impacts of the ancillary facility on previously unidentified heritage sites, provided: (a) any archaeological investigations undertaken under this condition shall be consistent with the requirements in condition B44 for Aboriginal heritage and condition B50 for non-Aboriginal heritage and with the Construction Heritage Management Plan or a methodology prepared to the satisfaction of the Secretary in consultation with OEH; and (b) the results of any relevant archaeological investigations undertaken under this condition shall be consistent with the reporting requirements of condition B45 for Aboriginal heritage and condition B50 for non-Aboriginal heritage and be described in the assessment of the ancillary facility required under conditions B74 and B75.	All	All	Pre-construction	Pacific Complete/ Contractors	Not applicable to current or proposed Ancillary Facility sites.
B79	The Applicant shall ensure that material extracted from the borrow sites established for the SSI, is only used for the construction of the SSI subject to this approval, and no other sections of the Pacific Highway or other works.	All	All	Construction	Pacific Complete/ Contractors	Not applicable to Section 1 W2HC
B80	The Applicant shall ensure that all plant and equipment used at the site is: (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient manner.	All	All	Pre-construction Construction	Pacific Complete/ Contractors	This has been achieved in accordance with commitments within the CNVMP.
B81	The Applicant shall ensure that during the operation of the SSI, water quality risks to the Woodburn Borefield drinking water catchment are minimised to the satisfaction of Rous Water.	8	Stage 2	Detailed Design	RMS Pacific Complete	Stage 2

COMPLIANCE TRACKING - MCoA Part C

Ministers Condition Of Approval	Requirement	W2B Section	Project Stage	Timing	Responsibility	Comment
C1	Prior to the commencement of construction or as otherwise agreed by the Secretary, the Applicant shall prepare and implement a Community Communication Strategy to the satisfaction of the Secretary. The Strategy shall provide mechanisms to facilitate communication between the Applicant (and its contractor(s)), the Environmental Representative (see condition D22), the relevant council and community stakeholders (particularly adjoining landowners) on the construction environmental management of the SSI. The Strategy shall include, but not be limited to: (a) identification of stakeholders to be consulted as part of the Strategy, including affected and adjoining landowners; (b) procedures and mechanisms for the regular distribution of information to community stakeholders on construction progress and matters associated with environmental management; (c) the formation of community-based focus groups for key environmental management issues for the SSI. The Strategy shall provide detail on the structure, scope, objectives and frequency of the community-based focus groups; (d) procedures and mechanisms through which the community stakeholders can discuss or provide feedback to the Applicant and/or Environmental Representative in relation to the environmental management and delivery of the SSI; (e) procedures and mechanisms through which the Applicant can respond to enquiries or feedback from the community stakeholders in relation to the environmental management and delivery of the SSI; and (f) procedures and mechanisms that would be implemented to resolve issues/ disputes that may arise between parties on the matters relating to environmental management and the delivery of the SSI. This may include the use of an appropriately qualified and experienced independent mediator. Issues that shall be addressed through the Community Communication Strategy include (but are not necessarily limited to): (i) traffic management (including property access, pedestrian access); (ii) heritage matters; (iii) landscaping and urban design matters; (iv) construction staging, hours and activities; (v) noise and vibration mitigation and management; (vi) air quality and dust; (vii) water quality, hydrology and flooding matters; and (viii) biodiversity matters. The Applicant shall maintain and implement the Strategy throughout construction of the SSI.	All	All	Pre-construction	RMS/Pacific Complete	An overarching Woolgoolga to Ballina Woolgoolga to Ballina Communication and Stakeholder Engagement Strategy has been prepared by Roads and Maritime Services. Strategy approved by DoEP 12 May 2015. Community Action Plan for section 1 was approved by Roads and Maritime on 29 April 2015
C2	Prior to the commencement of pre-construction and construction, or as otherwise agreed by the Secretary, the Applicant shall ensure that the following are available for community enquiries and complaints for the duration of construction: (a) a 24 hour telephone number(s) on which complaints and enquiries about the SSI may be registered; (b) a postal address to which written complaints and enquires may be sent; (c) an email address to which electronic complaints and enquiries may be transmitted; and (d) a mediation system for complaints unable to be resolved. The telephone number, the postal address and the email address shall be published in newspaper(s) circulating in the local area prior to the commencement of construction and prior to the commencement of operation. This information shall also be provided on the website (or dedicated pages) required by this approval.	All	All	Pre-construction Construction	RMS/Pacific Complete	24 hour number established - 1800 778 900, and email address W2B@rms.nsw.gov.au postal address advertised and available on website http://www.rms.nsw.gov.au/projects/northern-nsw/woolgoolga-to-ballina/index.html Roads and Maritime has created a page for W2HC under the main Woolgoolga to Ballina website. Email, post and phone details are provided on this page. Please refer to Woolgoolga to Ballina Communication and Stakeholder Engagement Strategy
C3	Prior to the commencement of pre-construction and construction, or as otherwise agreed by the Secretary, the Applicant shall prepare and implement a Construction Complaints Management System consistent with AS 4269: Complaints Handling and maintain the System for the duration of construction and up to 12 months following completion of the SSI. Information on all complaints received, including the means by which they were addressed and whether resolution was reached, with or without mediation, shall be maintained in a complaints register and included in the construction compliance reports required by this approval. The information contained within the System shall be made available to the Secretary on request.	All	All	Pre-construction	RMS/Pacific Complete	Roads and Maritime has developed an overarching Woolgoolga to Ballina Construction Complaints Management System. Please refer to Woolgoolga to Ballina Communication and Stakeholder Engagement Strategy . The Complaint procedure is addressed in of the CEMP. Refer to the approved Community Action Management Plan for W2HC for the complaints management procedure for the project.
C4	Prior to the commencement of pre-construction and construction, or as otherwise agreed by the Secretary, the Applicant shall establish and maintain a new website, or dedicated pages within an existing website, for the provision of electronic information associated with the SSI, for the duration of construction and for 12 months following completion of the SSI. The Applicant shall, subject to confidentiality, publish and maintain up-to-date information on the website or dedicated pages including, but not necessarily limited to: (a) information on the current implementation status of the SSI; (b) a copy of the documents listed in condition A2, and any documentation supporting modifications to this approval that may be granted from time to time; (c) a copy of this approval and any future modification to this approval; (d) a copy of each relevant environmental approval, licence or permit required and obtained in relation to the SSI; (e) a copy of each current strategy, plan, program or other document required under this approval; (f) the outcomes of compliance tracking in accordance with condition D27 of this approval; and (g) details of contact point(s) to which community complaints and enquiries may be directed, including a telephone number, a postal address and an email address.	All	All	Pre-construction Construction	RMS/Pacific Complete	An overarching web site addressing all active project stages has been developed. http://www.rms.nsw.gov.au/projects/northern-nsw/woolgoolga-to-ballina/index.html Copies of the project approvals, plans and licenses are available on the W2B Project Web site, which is being continually updated as plans are approved or deemed suitable.

COMPLIANCE TRACKING - MCoA Part D

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
D1	The Applicant shall develop a framework for finalising mitigation measures for threatened species. This Mitigation Framework shall be developed by a suitably qualified and experienced ecologist in consultation with DPI (Fisheries), OEH and DoE, and submitted to the satisfaction of the Secretary prior to commencement of detailed design of the relevant stage, unless otherwise agreed by the Secretary. The Mitigation Framework shall detail the process for finalising the biodiversity strategies, plans and programs required under this approval. The Mitigation Framework shall include: (a) a description of the methodology of all proposed pre-construction species and habitat surveys, including surveys undertaken in the 2013-2014 spring and summer seasons and as otherwise required under this project approval, and with reference where relevant to compliance with relevant NSW and Commonwealth field survey methods and guidelines; (b) a summary of potential changes to the avoidance, mitigation and/or offset measures specified in the documents listed in condition A2, as justified by the results of surveys described in condition D1(a); (c) a summary of the potential avoidance, mitigation and/or offset measures for all species for which the proposed level of impact or mitigation required differs from that assessed in the documents listed in condition A2, including evidence that those measures would achieve the same or an improved biodiversity outcome; (d) provision for updating the relevant Threatened Species Management Plans required under condition D8; and (e) a schedule for submission of all biodiversity strategies, plans and programs required under this approval in accordance with the requirements for submission in the conditions below.	All	All	Pre-construction	RMS	The Mitigation Framework was approved by the Department of Planning & Environment on the **8/5/15.** This document is part of the FFMP.
D2 (a)-(g)	The Applicant shall prepare and implement a Connectivity Strategy, to be submitted and approved by the Secretary prior to the commencement of construction. The strategy shall describe the rationale for, and final design and location of, fauna connectivity structures for the SSI and shall demonstrate the effectiveness of connectivity measures for the species targeted for the crossing. The Strategy shall be developed from the draft Connectivity Strategy in the documents listed in condition A2 in consultation with the OEH, DPI (Fisheries) and DoE, to the satisfaction of the Secretary. The Strategy shall include: (a) details of all crossings for terrestrial and aquatic fauna, including but not limited to land bridges, bridge, arch and culvert crossings, and crossings for arboreal fauna; (b) justification for the location and design, and spacing of the connectivity structures, with reference to relevant State and Commonwealth threatened species guidelines and the results of on-ground surveys as required by D2(d); (c) demonstration of the effectiveness of the connectivity structures (including exclusionary fencing) in terms of location, design and number of connectivity structures to mitigate impacts to the relevant threatened species, and that the crossings: (i) maintain or improve connectivity and movement pathways; (ii) reduce the risk of mortality for threatened species; (iii) are located at locations, at sufficient frequency along the alignment, based on the ecological requirements of the targeted species, including but not limited to home range size, movement patterns, and habitat use; (d) the results of surveys undertaken to determine the habitat, species movement patterns, distribution of species to confirm the design and location; (e) consideration of connectivity under the existing highway, service roads and local roads (servicing over 100 vehicles per day); (f) commitment that pathways to connectivity structures are not to be impeded by ancillary facilities, rest areas or service roads, or local roads (servicing over 100 vehicles per day) that are realigned as part of the SSI or experience an increase in traffic volumes during operation of the SSI; (g) commitment to implement the landscaping of vegetation leading to connectivity structures;	All	All	Pre-construction	RMS	The Connectivity Strategy for Sections 1 & 2 was approved by the Department of Planning & Environment on the **11/5/15.** This document is part of the FFMP.
D2 (h)-(m)	(h) a fencing strategy, describing the location, design and length of fencing, which must extend beyond the edges of habitat for threatened species; (i) the maintenance of connectivity measures and fencing for the life of the impact of the action, including the timing and frequency; (j) an assessment of the flooding risk for proposed structures, and measures to confirm and provide for flood immunity of those structures in light of this assessment. The agreement of the OEH on flood immunity levels shall be obtained prior to the commencement of construction of the relevant stage; (k) commitment that all bridges in identified wildlife corridors, or adjacent to threatened species habitat, or are likely to provide connectivity for threatened species based on surveys undertaken in accordance with the Mitigation Framework required in condition D1, shall provide a minimum three metre wide dry passage from toe of the scour protection to the top of the bank, with natural substrate and refuge features. Where this criteria cannot be achieved and with the agreement of the OEH, consideration shall be given to the use of suitable materials in, and the final form of, the scour protection to provide for the safe and effective passage of fauna; (l) detailed consideration of the effects of connectivity structures on the maintenance or improvement of population viability and gene flow; and (m) incorporate the outcomes of the Mitigation Framework required under condition D1. Unless connectivity measures can be demonstrated to be effective at successfully mitigating the barrier and fragmentation impact to relevant species, in accordance with the requirements of the construction flora and fauna management plan required under condition D26(e), and threatened species management plans required under conditions D8 and D9, the residual impact to connectivity shall be offset. Where the location and/or design of connectivity structures has changed from that identified in the documents listed under conditions A2(c) and A2(e), the Strategy shall demonstrate how the new location and/or design would result in an improved biodiversity outcome. The Strategy shall clearly identify how the connectivity structures will work in conjunction with other biodiversity measures, such as complementary fauna exclusion fencing measures and the regeneration/replanting of native vegetation, to be implemented for the SSI. The Applicant shall demonstrate to the satisfaction of the Secretary how public authority comments on the Strategy have been addressed. The Strategy may be submitted in stages to suit the staging of the SSI.	All	All	Pre-construction	RMS	The Connectivity Strategy for Sections 1 and 2 was approved by the Department of Planning & Environment on the 11/5/15. This document is part of the FFMP and requirements as per this approved plan are being addressed during the construction phase.

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
D3	The Applicant shall prepare and implement a Biodiversity Offset Strategy to outline how the ecological values lost as a result of the SSI will be offset in perpetuity. The Strategy shall be developed from the draft Biodiversity Offset Strategy in the documents listed in condition A2, in consultation with the OEH, DPI (Fisheries) and DoE, to the satisfaction of the Secretary. Unless otherwise agreed to by the OEH, DPI (Fisheries) and DoE, offsets shall be provided on a like-for-like basis and at a minimum ratio of 4:1 for native vegetation (including salt marsh) impacted by the SSI or as required by the Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy (Commonwealth of Australia 2012) and Offsets Assessment Guide (Commonwealth of Australia 2012), whichever is the greater. The Strategy shall include, but not necessarily be limited to: (a) the objectives and outcomes that would be sought through a biodiversity offset package, including to achieve a neutral or net beneficial outcome for all threatened species and endangered ecological communities likely to be impacted directly or indirectly during both the construction and operation of the SSI; (b) confirmation of the vegetation type/habitat (in hectares) to be cleared and their condition, and the size of offsets required (in hectares); (c) details of the available offset measures that have been selected to compensate for the loss of existing native vegetation (including mangroves, salt marsh and riparian vegetation), threatened and vulnerable species and Endangered Ecological Communities and their habitats, and identification of potential offset sites; (d) consideration of contingency measures for offsets to address potential changes to impacted areas as a result of detailed design changes; (e) a process for addressing and incorporating offset measures arising from changes in biodiversity impacts (where these changes are generally consistent with the biodiversity impacts identified for the SSI in documents listed under condition A2), including: (i) changes to the SSI footprint due to detailed design; (ii) changes to predicted impacts as a result of changes to mitigation measures; (iii) the identification of additional species/habitat through pre-clearance surveys and construction; and (iv) additional impact associated with the establishment of ancillary facilities; (f) the decision-making framework that would be used to select the final suite of offset measures to achieve the objectives and outcomes established within the Strategy, including the ranking of offset measures; and (g) options for securing and management of biodiversity offsets in perpetuity. The Applicant may elect to satisfy the requirements of this condition by identifying a suitable offset strategy which addresses impacts from multiple Pacific Highway Upgrade projects within the North Coast bioregion. Any such strategy, including an agreement made with OEH and DoE, shall be approved by the Secretary within a timeframe agreed to by the Secretary. The Biodiversity Offset Strategy shall be submitted to, and approved by, the Secretary prior to the commencement of construction work that would result in the disturbance of the relevant existing ecological communities, threatened species, or their habitat, unless otherwise agreed by the Secretary.	1,2, 3, 4, 6, 9,10,11	All	Pre-construction and Construction	RMS	Department of Planning and Environment and Department of the Environment approved a variation for the submission of the Biodiversity Offset Status Report within 3 months of commencement of sections 1 and 2 and approval of the Biodiversity Offset Status Report prior to commencement of Stage 2 works. The Biodiversity Offset Status Report (D4) was both submitted as per the variation timeline. The Biodiversity Offset Status Report was approved on the 6/1/16.
D4	Prior to the commencement of construction work that would result in the disturbance of the relevant existing ecological communities, threatened species, or their habitat, unless otherwise agreed by the Secretary, the Applicant shall submit for the approval of the Secretary, the offset sites for the species listed under condition D4(a). The selection of the offset sites should be undertaken in consultation with the OEH, DPI (Fisheries) and DoE. Submission of the offset sites for approval shall be accompanied by: (a) details of offset sites to compensate the impacts on: (i) Koala populations in Coolgardie/Bagotville, Broadwater and Woombah/Iluka; (ii) Moonee Quassia (Quassia sp. Moonee Creek); (iii) Sandstone Rough–Barked Apple (Angophora robur); (iv) Singleton Mint Bush (Prostanthera cineolifera); and (v) Lowland Rainforest in Sub-tropical Australia; (b) a map that defines the locations and boundaries of the sites; (c) demonstration, through ground truthing survey or an alternative method(s), the adequacy of the site(s), in terms of habitat suitability and presence of the relevant species, to offset the impacts of the SSI; (d) consideration of how the offsets achieve the outcomes required by the Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy to the satisfaction of DoE; and (e) details of how the offset sites would be secured and managed in perpetuity.	1,2, 3, 4, 6, 9,10,11	All	Pre-construction and Construction	RMS	Department of Planning and Environment and Department of the Environment approved approved a variation for the submission of the Biodiversity Offset Strategy and Offset Status Report within 3 months of commencement of sections 1 and 2 and approval of the Biodiversity Offset Strategy and Offset Status Report prior to commencement of Stage 2 works. The Biodiversity Offset Strategy and Offset Status Report (D4) were both submitted as per the variation timeline. The Biodiversity Offset Strategy was approved by the Department of Planning & Environment on the 6/1/16 The The Biodiversity Offset Strategy was approved by the Department of the Environment the 7/1/16
D5 (a)-(g)	The Applicant shall prepare and implement (following approval) a Biodiversity Offset Package, within twenty-four months of approval of the Biodiversity Offset Strategy, or as otherwise agreed by the Secretary. The package shall detail how the ecological values lost as a result of the SSI will be offset. The Biodiversity Offset Package shall be prepared in consultation with the OEH, DPI (Fisheries) and DoE, for the approval of the Secretary, and shall (unless otherwise agreed by the Secretary) include, but not necessarily be limited to: (a) the identification of the extent and types of habitat that would be lost or degraded as a result of the final design of the SSI; (b) the objectives and biodiversity outcomes to be achieved; (c) details of the final suite of the biodiversity offset measures selected and secured in accordance with the Biodiversity Offset Strategy including the identification of all offset sites, including, offset attributes, shapefiles, textual descriptions and maps that clearly define the location, boundaries of the offset areas; (d) an assessment demonstrating how the offset area(s) achieve the outcomes required by the Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy and user guide to the written satisfaction of DoE; (e) the management and monitoring requirements for compensatory habitat works and other biodiversity offset measures proposed to ensure the outcomes of the package are achieved, including: (i) the monitoring of the condition of species and ecological communities at offset locations; (ii) the methodology for the monitoring program(s), including the number and location of offset monitoring sites, and the sampling frequency at these sites; (iii) provisions for the annual reporting of the monitoring results for a set period of time as determined in consultation with the OEH, DPI (Fisheries) and DoE; and (iv) the monitoring and reporting on the effectiveness of these measures, and progress against the performance and completion criteria; (f) the results of targeted field surveys within the offset sites (undertaken at any ecologically appropriate time of the year) to assess and describe habitat suitability, presence/absence of threatened species and ecological communities and an assessment of the baseline population; (g) a description of the current quality (prior to any management activities) of the offset area(s);	All	All	Pre-construction and Construction	RMS	The Department of Planning & Environment approved an extension of time for the Biodiversity Offset Strategy until 3 months after the start of construction. The Biodiversity Offset Strategy was approved by the Department of Planning & Environment on the 6/1/16 The Biodiversity Offset Strategy was approved by the Department of the Environment the 7/1/16 RMS will prepare and implement (following approval) a Biodiversity Offset Package, within twenty-four months of approval of the Biodiversity Offset Strategy, or as otherwise agreed by the Secretary.

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
D5(h)-(m)	(h) targeted management actions, regeneration and/or revegetation strategies to be undertaken on the offset area(s) to improve the ecological quality of these areas for the relevant species and communities; (i) clear performance objectives for management actions that will enable maintenance and enhancement of habitat within the offset area, as well as contribute to the better protection of individuals and/or populations of the relevant species; (j) performance and completion criteria for evaluating the management of the offset area, including contingency actions, criteria for triggering contingency actions and a commitment to the implementation of these actions in the event that performance objectives are not met; a program to monitor and report on the effectiveness of these measures, and progress against the performance and completion criteria; (k) timing and responsibilities for the implementation of the provisions of the Biodiversity Offset Package and achieving performance objectives; (l) details of who would be responsible for monitoring, reviewing, and implementing the Biodiversity Offset Package; and (m) a description of funding arrangements or agreements including work programs and responsible entities. Land offsets shall be consistent with the Principles for the use of Biodiversity Offsets in NSW. Any land offset shall be enduring and be secured by a conservation mechanism which protects and manages the land in perpetuity. Where land offsets cannot solely achieve compensation for the loss of habitat, additional measures shall be provided to collectively deliver an improved or maintained biodiversity outcome for the region. The Biodiversity Offset Package shall include details of the offset sites approved under condition D4, and timeframe for the delivery of the offset sites. Where monitoring required under conditions D8 and/or D9 indicates that biodiversity outcomes are not being achieved, remedial actions. as approved by the Secretary, shall be undertaken to ensure that the objectives of the Biodiversity Offset Package are achieved. The requirements of the Biodiversity Offset Package shall be implemented by the responsible parties according to the timeframes set out in the Biodiversity Offset Package, unless otherwise agreed by the Secretary. Note: • If an offset site proposed as a part of the Biodiversity Offset Strategy or Biodiversity Offset Package is already required to be protected as a result of a separate approval, only the management actions which can be demonstrated to be additional to those required for the separate approval, can be considered as an offset for this project in accordance with the EPBC Act Environmental Offsets Policy 2012 (or subsequent published revisions).	All	All	Pre-construction and Construction	RMS	Department of Planning and Environment and Department of the Environment approved approved a variation for the submission of the Biodiversity Offset Strategy and Offset Status Report within 3 months of commencement of sections 1 and 2 and approval of the Biodiversity Offset Strategy and Offset Status Report prior to commencement of Stage 2 works. The Biodiversity Offset Strategy and Offset Status Report (D4) were both submitted as per the variation timeline. The Biodiversity Offset Strategy was approved by the Department of Planning & Environment on the 6/1/16 The Biodiversity Offset Strategy was approved by the Department of the Environment the 7/1/16 RMS will prepare and implement (following approval) a Biodiversity Offset Package, within twenty-four months of approval of the Biodiversity Offset Strategy, or as otherwise agreed by the Secretary.
D6	Prior to the commencement of construction of the relevant stage that would result in the disturbance of native vegetation (or as otherwise agreed by the Secretary), the Applicant shall prepare and implement a Nest Box Plan to provide replacement hollows for displaced fauna. The Plan shall be prepared in consultation with the OEH and to the satisfaction of the Secretary. The Plan shall be prepared by a suitably qualified and experienced ecologist and detail the number and type of nest boxes to be installed, which shall be justified based on the number and type of hollows removed (based on pre clearing surveys), the density of hollows in the area to be cleared and in adjacent areas, and the availability of adjacent food resources. The Plan shall also provide details of maintenance protocols for the nest boxes installed including responsibilities, timing and duration.	All	All	Pre-construction and Construction	RMS and Contractor	The Nest Box Plan for Stage 1 W2B was approved by the Department of Planning & Environment on the **17/2/15.** This document is part of the FFMP. 70 % of the required nest boxes on Sections 1 & 2 were installed pre construction & the remaining 30% nest boxes as per the Nest Box Plan have been installed.
D7	The Applicant shall prepare and implement a Flora Translocation Strategy to determine the feasibility and potential efficacy of translocation measures (as identified in the threatened species management plans required under condition D8), prior to the commencement of construction work that would result in the disturbance of threatened flora species for which translocation is proposed. The Strategy shall be prepared by a suitably qualified and experienced ecologist, in consultation with the OEH and DoE, and to the satisfaction of the Secretary. The Strategy shall include: (a) a feasibility assessment of timeframe and staging requirements, availability of expertise, risk effectiveness analysis and availability/suitability of translocation sites; (b) detail of species specific information on the proposed methods of, and discussion of results of past recorded responses to, translocations; (c) a framework for the translocation process applicable to each affected species; and (d) consideration of appropriate compensatory habitat in the Biodiversity Offsets Package required under condition D5 where translocation is not reasonable or feasible.	All	All	Pre-construction	RMS	The Flora Translocation Strategy for Sections 1 & 2 was approved by the Department of Planning & Environment on the **12/5/15.** This document is part of the FFMP. Eucalyptus tetrapleura seed has been collected. In addition, a number of non threatened species Lepidopsperma plants have been collected from the southern side of Wells Crossing and these are growing in a north coast nursery. All required threatened flora has been translocated for Sections 1 and 2.
D8 (a)-(h)	The Applicant shall prepare and implement Threatened Species Management Plans to detail how impacts of the SSI will be minimised and managed specifically for each species identified as significantly impacted in the documents listed in condition A2 or in accordance with condition D1. The Plans shall be developed from the draft Threatened Species Management Plans included in the documents listed in condition A2(c) (subject to condition D9), in consultation with OEH, DPI (Fisheries) and DoE, and to the satisfaction of the Secretary, and shall include but not necessarily be limited to: (a) demonstration that adequate surveys have been undertaken to assess the impacts of the SSI with reference to the Mitigation Framework developed under condition D1, including baseline data collected from surveys, undertaken by a suitably qualified and experienced ecologist on threatened species and ecological communities within all habitat areas to be cleared of vegetation for the SSI, that are likely to contain these species and that are likely to be adversely impacted by the SSI (as determined by a suitably qualified expert). The data shall address the densities, distribution, habitat use and movement patterns of these species; (b) identification of potential impacts on each species; (c) details of and demonstrated effectiveness of the proposed avoidance and mitigation and management measures to be implemented for each threatened species including measures to at least maintain habitat values of habitat areas compared to baseline data and maintain connectivity for the relevant species; (d) an adaptive monitoring program to assess the use of the mitigation measures identified in conditions B10 and D2. The monitoring program shall nominate appropriate and justified monitoring periods, performance parameters and criteria against which effectiveness of the mitigation measures will be measured and include operational road kill and fauna crossing surveys to assess the use of fauna crossings and exclusion fencing implemented as part of the SSI; (e) monitoring methodology for threatened flora and fauna adjacent to the SSI footprint, (f) goals and performance indicators to measure the success of mitigation measures, which shall be specific, measurable, achievable, realistic and timely (SMART), and be compared against baseline data; (g) methodology for the ongoing monitoring of road kill, the species densities, distribution, habitat use and movement patterns, and the use of fauna crossings during construction and operation of the SSI, including the proposed timing, and duration of that monitoring; (h) provision for the assessment of monitoring data to identify changes to habitat usage and whether this can be attributed to the SSI;	All	All	Pre-construction and Construction	RMS and Contractor	The Threatened Flora Management Plan for Sections 1 & 2 was approved by the Department of Planning & Environment on the **5/5/15.** The Threatened Mammal Management Plan for Sections 1 & 2 was approved by the Department of Planning & Environment on the **12/5/15.** The Threatened Frog Management Plan was approved by the Department of Planning & Environment on the **7/5/15.** The Threatened Glider Management Plan was approved by the Department of Planning & Environment on the **5/5/15.** The Threatened Bat Management Plan for Sections 1 & 2 was approved by the Department of Planning & Environment on the **29/9/14.** The Koala Management Plan for Sections 1 & 2 was approved by the Department of Planning & Environment on the **11/5/15.** These documents are part of the FFMP.
D8 (i)-(l)	(i) details of contingency measures that would be implemented in the event of changes to habitat usage patterns, entities, distribution, and movement patterns attributable to the construction or operation of the SSI, based on adequate baseline data; (j) mechanisms for the monitoring, review and amendment of these plans; (k) provision for ongoing monitoring during operation of the SSI (for operation/ongoing impacts) until such time as the use and effectiveness of mitigation measures can be demonstrated to have been achieved over a minimum of three successive monitoring periods, unless otherwise agreed by the Secretary in consultation with the OEH, DPI (Fisheries) and DoE; and (l) provision for annual reporting of monitoring results to the Secretary and the OEH, DPI (Fisheries) and DoE, or as otherwise agreed by those agencies. In developing the Plans, the Applicant shall demonstrate to the satisfaction of the Secretary and DoE, how the public authorities and expert reviewer recommendations provided for each draft plan in the documents listed in condition A2(c) have been addressed, including detailed justification of any variance from the recommendations of the expert reviewer of the management plans, including analysis of potential risk to the threatened species. The Plans must be submitted and approved by the Secretary prior to commencement of construction of the relevant stages of the action, and implemented prior to commencement of construction of the relevant stages, unless otherwise agreed by the Secretary.	All	All	Pre-construction and Construction	RMS and Contractor	The Threatened Flora Management Plan for Sections 1 & 2 was approved by the Department of Planning & Environment on the **5/5/15.** The Threatened Mammal Management Plan for Sections 1 & 2 was approved by the Department of Planning & Environment on the **12/5/15.** The Threatened Frog Management Plan was approved by the Department of Planning & Environment on the **7/5/15.** The Threatened Glider Management Plan was approved by the Department of Planning & Environment on the **5/5/15.** The Threatened Bat Management Plan for Sections 1 & 2 was approved by the Department of Planning & Environment on the **29/9/14.** The Koala Management Plan for Sections 1 & 2 was approved by the Department of Planning & Environment on the **11/5/15.**These documents are part of the FFMP.

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
D9 (a)-(c)	As part of the Threatened Species Management Plans required under condition D8, the Applicant shall prepare and implement a Koala Management Plan to demonstrate the ongoing survival of the Koala populations at Coolgardie/Bagotville, Broadwater and Woombah/Iluka. The Plan shall be prepared by a suitably qualified and experienced species expert and shall include, but not necessarily be limited to: (a) results of detailed surveys to determine: (i) the population status of the Coolgardie/Bagotville, Broadwater and Woombah/Iluka Koala populations; (ii) habitat use and movement patterns of Koala populations within five kilometres of the proposed upgrade, or such area as determined by the independent ecologist; and (iii) habitat areas likely to be fragmented by the SSI; including the results of SPOT assessment and radio tracking. The results and adequacy of surveys shall be verified by an independent suitably qualified and experienced ecologist with appropriate qualifications and experience in Koala and road ecology. Where appropriate, the Applicant may vary the required area of survey specified under condition D9(a)(ii) to the satisfaction of the independent ecologist; (b) a detailed assessment of the impacts to the Koala populations based on the survey results required by condition D9(a), including population impacts and the identification of habitat likely to be fragmented and/or isolated as a result of the SSI; (c) a detailed description, including the location and design, of all proposed avoidance and mitigation measures;	6,9,10	Stage 2	Pre-construction	RMS	Stage 2
D9 (d)	(d) justification that the location and design of mitigation measures: (i) have been designed with the objective of no Koala road kill from the commencement of construction of the SSI. In the event that a Koala is injured or killed during construction or operation, this shall be reported on the Applicant's website within 24 hours of this occurring, and the record shall remain available for a period of at least five years, unless otherwise agreed by the Secretary; (ii) include permanent fencing of the entire SSI for the length of the distribution of the Coolgardie/Bagotville, Broadwater and Woombah/Iluka populations and for two kilometres beyond the distribution of the Coolgardie/Bagotville, Broadwater and Woombah/Iluka population, following the highway or to the nearest natural barrier to Koala movement (e.g. river), after baseline surveys are complete in accordance with condition D9(a) and prior to operation; (iii) result in the complete, safe crossing of fauna crossings by the Koala. Fauna crossings shall be provided at a sufficient frequency to ensure that habitat connectivity is maintained or improved from pre-construction conditions, as determined by the independent ecologist and agreed by OEH; (iv) provide sufficient opportunities for species dispersal and re-colonisation as determined by the independent ecologist and OEH; (v) are in areas that, and are at a sufficient frequency to, achieve (i) - (iv), based on site specific information contained in the survey results required by condition D9(a) and the ecological requirements of the Koala, including but not limited to home range size, local movement patterns and habitat use, in accordance with the advice of the independent ecologist and OEH; (vi) all koala underpass structures shall have a minimum height and width of 2.4 metres and a maximum length of 40 metres, or a minimum height and width of 3 metres and a maximum length of 50 metres. The underpass/culvert entrance shall be located at ground level, and no higher in the fill. Structures that provide passage over the road shall have a minimum width of 30 metres and shall be treated with contiguous habitat features; (vii) provide passage for Koalas under or over the existing highway (where the existing highway forms part of the SSI) and service roads or local roads (servicing over 100 vehicles per day); (viii) effectively minimise the risk of predation from dogs in both dedicated and combined crossings; (ix) provide dry passage for dedicated fauna crossings and for combined fauna crossings to the satisfaction of OEH and DoE, at a flood immunity level determined in accordance with condition D2(c)(j); (x) provide habitat linkages to crossing structures from adjacent Koala habitat; and (xi) ensures that pathways to connectivity structures are not impeded by ancillary facilities, rest areas, service roads or local roads;	6,9,10	Stage 2	Pre-construction	RMS	Stage 2
D9 (e)-(i)	(e) if the mitigation measures discussed in condition D9(d) cannot be demonstrated to be effective to the satisfaction of the Secretary, in consultation with OEH and DoE, provision for the Plan to be revised to include the design and construction of a minimum of one dedicated underpass or land bridge every 500 metres. Underpass structures shall have a minimum height and width of three metres and a maximum length of 50 metres. (f) provision for the installation and vegetation planting of fauna overpasses prior to the commencement of construction; (g) a revegetation strategy to be implemented to increase connectivity adjacent to the SSI and leading to crossing locations, and the provision of vegetation planting on land bridges, to ensure the establishment of the vegetation prior to the commencement of construction; (h) details of the proposed monitoring methodology to ensure the effectiveness of the mitigation measures and the ongoing survival of the Coolgardie/Bagotville, Broadwater and Woombah/Iluka Koala populations. Monitoring shall: (i) include goals that demonstrate the mitigation measures are effective, including clear objectives, milestones, performance measures, corrective actions, and thresholds for corrective actions, and timeframes for completion; (ii) occur until such time as the mitigation measures are demonstrated to be effective for three consecutive monitoring periods, or as agreed by the Secretary, to the satisfaction of the independent ecologist and OEH; and (iii) for the purposes of the Coolgardie/Bagotville population, consider the results of the surveys undertaken in the Koala habitat and population assessment: Ballina Shire Council LGA (Biolink Ecological Consultants Pty Ltd, November 2013) in determining the baseline population; (i) where the results of monitoring undertaken in accordance with condition D9(h) suggests that the mitigation measures are ineffective or changes to the population have occurred, the Applicant shall provide the Secretary, within one month of recording the changes, the corrective actions that have been implemented or proposed to be implemented, or a procedure for demonstrating that this change is not a result of the SSI. Should the Applicant be unable to demonstrate to the satisfaction of the Secretary that any change to the population is not attributable to the SSI, the SSI shall be deemed as the cause of the impact and the Applicant shall, within one month of these findings, provide, to the satisfaction of the Secretary, in consultation with the OEH and DoE, the proposed corrective actions to address the impacts of the SSI. Any required corrective actions shall include, but not necessarily be limited to: (i) installation of further crossings or modifications to existing crossings and the provision of evidence of the complete, safe crossing of these fauna crossings by the Koala. Any additional crossings shall be provided at a sufficient frequency to ensure that habitat connectivity is maintained or improved from pre-construction conditions, within two years of their installation; and (ii) reassessment of all revegetation areas and frequent reporting and maintenance including addressing failures;	6,9,10	Stage 2		RMS	NA
D9 (j)-(k)	(j) if the measures in condition D9(i) cannot be demonstrated to be successful within one year of their implementation, procedure for the submission of further offsets in accordance with conditions D5 and D6(j), to be provided within one year of these findings. Further offsets may include: (i) the legal protection and conservation management of additional areas of existing habitat that actively regenerated and secured into conservation management; and/or (ii) strategic revegetation of cleared areas to improve connectivity; and/or (iii) development of a supplementary feeding program and/or breeding program; and/or (iv) development of a long term predator control program; and (k) evidence of consultation with species experts, OEH and DoE in addressing the requirements of this condition, and demonstration of how comments provided by the species experts, OEH and DoE, as a result of this consultation, have been addressed. The Koala Management Plan shall be submitted and approved by the Secretary prior to the commencement of construction of the relevant stages of the SSI. The approved Koala Management Plan shall be implemented prior to the commencement of construction of the relevant stages.	6,9,10	Stage 2	Pre-construction	RMS	Stage 2
D10	Prior to the commencement of construction, the Applicant shall undertake a land use survey to identify areas that are sensitive to construction vibration and construction ground-borne noise impacts. The results of the survey shall be incorporated into the Construction Noise and Vibration Management Plan.	All	All	Pre-construction and Construction	Contractor	A survey has been undertaken for Sections 1 & 2 to identify areas that are sensitive to construction vibration and construction ground-borne noise impacts. The results of these survey have be incorporated into the Construction Noise and Vibration Management Plans for Sections 1 & 2.

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
D11	The Applicant shall prepare a review of the operational noise mitigation measures proposed to be implemented for the SSI, within six months of commencing construction, unless otherwise agreed by the Secretary. The review shall be prepared in consultation with the EPA, to the satisfaction of the Secretary. The review may be submitted in stages to suit the staged construction of the SSI and shall: (a) confirm the operational noise predictions of the SSI based on detailed design. This operational noise assessment shall be based on an appropriately calibrated noise model (which has incorporated additional noise monitoring, where necessary for calibration purposes); (b) review the suitability of the operational noise mitigation measures identified in the documents listed in condition A2. The review shall take into account the detailed design of the SSI and, where feasible and reasonable, and where necessary, refine the proposed measures with the objective of meeting the criteria outlined in the NSW Road Noise Policy (Department of Environment, Climate Change and Water, 2011), based on the operational noise performance of the SSI predicted under (a) above; and (c) where necessary, investigate additional feasible and reasonable noise mitigation measures to achieve the criteria outlined in the NSW Road Noise Policy (DECCW, 2011).	All	All	Pre-construction and Construction	RMS	Following approval of the Operation Noise Management Report (ONMR) and associated consultation on 2 nd June 2015 by DPE , mitigation measures as identified in the ONMR will commence. Low noise pavement has been designed for the first 1.8km of section 1 as required by the ONMR and noise walls will surround the Arrawarra Rest Area. Changes in design has seen 17 previously identified houses no longer requiring treatment and 5 others now eligible. The total to receive treatment is 41 residence. These residence (both eligible and no longer eligible) were notified by letter (Dec 2015) and procurement of the managing contractor is underway to commence the at house treatments.
D12	The Applicant shall prepare and implement a Water Quality Monitoring Program, to monitor the construction and operation impacts of the SSI on surface and groundwater quality and resources and wetlands, prior to construction. The Program shall be prepared in consultation with the OEH, EPA, DPI (Fisheries), NOW, DoE and Rous Water (in relation to the Woodburn borefields), to the satisfaction of the Secretary, and shall include but not necessarily be limited to: (a) identification of surface and groundwater quality monitoring locations (including watercourses, waterbodies and SEPP14 wetlands) which are representative of the potential extent of impacts from the SSI; (b) the results of any groundwater modelling undertaken; (c) identification of works and activities during construction and operation of the SSI, including emergencies and spill events, that have the potential to impact on surface water quality of potentially affected waterways and known Oxleyan Pygmy Perch habitat; (d) development and presentation of parameters and standards against which any changes to water quality will be assessed, having regard to the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 (Australian and New Zealand Environment Conservation Council, 2000) or relevant baseline data; (e) representative background monitoring of surface and groundwater quality parameters for a minimum of twelve months (considering seasonality) prior to the commencement of construction, to establish baseline water conditions, unless otherwise agreed by the Secretary; (f) a minimum monitoring period of three years following the completion of construction or until the affected waterways and/or groundwater resources are certified by an independent expert as being rehabilitated to an acceptable condition. The monitoring shall also confirm the establishment of operational water control measures (such as sedimentation basins and vegetation swales); (g) contingency and ameliorative measures in the event that adverse impacts to water quality are identified; and (h) reporting of the monitoring results to Department of Planning and Environment, OEH, EPA, DPI (Fisheries), NOW, DoE and Rous Water (in relation to the Woodburn borefields).	All	All	Pre-construction, Construction and Operation	RMS	The Water Quality Monitoring Program for Sections 1 & 2 was approved by the Department of Planning & Environment on the **8/5/15.** OHLY are undertaking surface water quality monitoring in accordance with the approved Water Quality Monitoring Program. RMS continues to monitor groundwater levels and water quality as per the Water Quality Monitoring Program
D13	The Applicant shall prepare and implement a Hydrological Mitigation Report for properties where flooding and/or hydrological impacts are predicted to exceed the relevant flood management objective in the documents listed in condition A2 as a result of the SSI. The Report shall be prepared by a suitably qualified expert and be based on detailed surveys (e.g. floor levels) and associated assessment of potentially flood affected properties in the Corindi, Clarence and Richmond river floodplains. The Report shall: (a) identify properties in those areas likely to have an increased/exacerbated impact and detail the predicted impact; The types of impacts to be considered include all those examined in the EIS including but not limited to changes in flood levels and velocities, alteration to drainage, reduction in flood evacuation access or capability, impacts on infrastructure, impacts on stock and agriculture, and impacts to the environment; (b) identify mitigation measures to be implemented to address these impacts; (c) identify measures to be implemented to minimise scour and dissipate energy at locations where flood velocities are predicted to increase as a result of the SSI and cause localised soil erosion and/or pasture damage; (d) be developed in consultation with the relevant council, NSW State Emergency Service and directly-affected landowners; (e) identify operational and maintenance responsibilities for items (a) to (c) inclusive; and (f) refer to the assessments described in conditions B31 and B32. The report may be submitted in stages to suit the staged construction of the SSI. Construction shall not commence within those areas likely to have altered flood conditions until such time as works identified in the hydrological mitigation report have been completed, unless otherwise agreed by the Secretary.	All	All	Pre-construction	RMS	The Hydrological Mitigation Report for Corindi was submitted for approval to DP&E on 1/05/15. Although soft soil works are located in the Clarence and Richmond river floodplains, flood modelling conducted during the detailed design indicates that hydrological impacts due to the construction of embankments in these areas are not predicted to exceed the relevant flood management objective.
D14	Based on the mitigation measures identified in condition D13, the Applicant shall prepare and implement a final schedule of feasible and reasonable flood mitigation measures proposed at each directly-affected property in consultation with the landowner. The schedule shall be provided to the relevant landowner(s) prior to the implementation/construction of the mitigation works, unless otherwise agreed by the Secretary. A copy of each schedule of flood mitigation measures shall be provided to the Department of Planning and Environment and the relevant council prior to the implementation/construction of the mitigation measures on the property.	All	All	Pre-construction	RMS	The Hydrological Mitigation Report for Corindi was submitted for approval to DP&E on 1/05/15. As outlined in the report, RMS is undertaking community consultation on the Blackadder Safety works mitigation. This work is proposed to be undertaken following the upgrade of Section 1.
D15	The Applicant shall employ a suitably qualified and experienced independent hydrological expert, whose appointment has been endorsed by the Secretary, to deal with all hydrological matters and assist landowners in negotiating feasible and reasonable mitigation measures.	All	All	Pre-construction	RMS	WMAWater Pty Ltd has been appointed as Independent Hydrological Expert for the Woolgoolga to Ballina Project to comply the requirements of Condition D15 on 30 April 2015.
D16	The Applicant shall provide feasible and reasonable assistance to the relevant council and/or NSW State Emergency Service, to prepare any new or necessary update(s) to the relevant plans and documents in relation to flooding, to reflect changes in flooding levels, flows and characteristics as a result of the SSI.	All	All	Pre-construction	RMS	Noted, and will be undertaken as required. For Corindi, ongoing consultation will occur regarding the Blackadder Ck safety works. Coffs Harbour City Council, in collaboration with the SES, are installing 2 flood gauges on the Corindi Ck system.
D17	The Applicant shall prepare and implement a Signage Policy to addresses the impact of towns (South Grafton, Ulmarra, Tyndale, Woodburn, Broadwater and Wardell) which are bypassed by the SSI, at least six months prior to operation, unless otherwise agreed by the Secretary. The Policy shall be prepared in consultation with the relevant council and to the satisfaction of the Secretary. The Policy shall be consistent with the Guide: Signposting (RTA July 2007), Tourist Signposting guide (RMS and Destination NSW 2012) and provide for signage that: (a) provides information on the range of services available within the bypassed towns of South Grafton. Ulmarra, Tyndale, Woodburn, Broadwater and Wardell; and (b) informs motorists of routes through the bypassed towns that may be taken as an alternative to the highway. The Policy may be submitted in stages to suit the staged construction of the SSI.	3, 8, 9, 10	Stage 2	Pre-construction	RMS	NA
D18	The Applicant shall prepare and implement a Business Access Strategy to address changes to access to businesses along the highway, at least six months prior to operation. The Strategy shall be prepared in consultation with the relevant council, business owners and the New Italy Museum and to the satisfaction of the Secretary. Note • The Applicant may incorporate the requirements of this condition into the Signage Policy for the SSI under condition D17.	All	All	Construction	RMS	Noted
D19	Upon determining the haulage route(s) for construction vehicles associated with the SSI, and prior to construction, an independent and qualified expert shall prepare a Road Dilapidation Report. The Report shall assess the current condition of the road and describe mechanisms to restore any damage that may result due to its use by traffic and transport related to the construction of the SSI. The Report shall be submitted to the relevant council for review prior to the commencement of haulage. Following completion of construction, a subsequent Report shall be prepared to assess any damage to the road that may have resulted from the construction of the SSI. Measures undertaken to restore or reinstate roads affected by the SSI shall be undertaken in a timely manner, in accordance with the reasonable requirements of the relevant council, and at the full expense of the Applicant. Note: • Nothing in this condition restricts the Applicant commencing adjustments and minor upgrades to the existing road network to cater for construction traffic and installation of temporary project signage prior to the commencement of construction.	All	All	Pre-construction and Construction	Contractor	In accordance with RMS Specification G10, each contractor is required to undertake this survey prior to commencing works on the site. All road dilapidation surveys for the local roads around Section 1 & the Pacific Highway [in the area of Section 1] have been completed. The road dilapidation report for Section 2 has been completed by CMC and forwarded to RMS and Council.

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
D20 (a)-(d)	The Applicant shall prepare and implement an Urban Design and Landscape Plan prior to the commencement of permanent built works and/or landscaping, unless otherwise agreed by the Secretary, to present an integrated landscape and design for the SSI. The Plan shall be prepared in accordance with the Roads and Maritime Services urban design and visual guidelines, the design principles outlined in the EIS, and the revegetation principles outlined in the EIS Working Paper—Biodiversity. The Plan shall be prepared by an appropriately qualified expert in consultation with the relevant council and community, to the satisfaction of the Secretary. The Plan shall include, but not necessarily be limited to: (a) identification of design principles and standards based on: (i) local environmental values, (ii) heritage values; (iii) urban design context; (iv) sustainable design and maintenance; (v) community amenity and privacy; (vi) relevant design standards and guidelines; and (vii) the urban design objectives outlined in Section 4.2 of the EIS Working Paper—Urban Design Landscape Character and Visual Impact; (b) the location of existing vegetation and proposed landscaping (including use of indigenous and endemic species where possible). Details of species to be replanted/revegetated shall be provided, including their appropriateness to the area and habitat for threatened species; (c) a description of locations along the corridor directly or indirectly impacted by the construction of the SSI (e.g. temporary ancillary facilities, access tracks, watercourse crossings, etc.) and details of the strategies to progressively rehabilitate regenerate and/or revegetate the locations with the objective of promoting biodiversity outcomes and visual integration; (d) take into account appropriate roadside plantings and landscaping in the vicinity of heritage items and ensure no additional heritage impacts;	All	All	Pre-construction and Construction	RMS and Contractor	For sections 1 & 2, an Urban Design and Landscape Plan that addresses this condition has been submitted and approved by the Department of Planning & Environment on the **8/5/15.**
D20 (e)-(k)	(e) a description of disturbed areas (including borrow sites) and details of the strategies to progressively rehabilitate, regenerate and/or revegetate these areas, including clear objectives and timeframes for rehabilitation works, procedures for monitoring success of regeneration or revegetation, and corrective actions should regeneration or revegetation not conform to the objectives adopted; (f) location and design treatments for any associated footpaths and cyclist elements, and other features such as seating, lighting (in accordance with AS 4282-1997 Control of the Obtrusive Effect of Outdoor Lighting), fencing, materials and signs; (g) an assessment of the visual screening effects of existing vegetation and the proposed landscaping and built elements. Where properties have been identified as likely to experience high visual impact as a result of the SSI and high residual impacts are likely to remain, the Applicant shall, in consultation with affected landowners, identify opportunities for providing at-property landscaping to further screen views of the SSI. Where agreed with the landowner, these measures shall be implemented during the construction of the SSI; (h) graphics such as sections, perspective views and sketches for key elements of the SSI, including, but not limited to built elements of the SSI; (i) strategies for progressive landscaping and other environmental controls such as erosion and sedimentation controls, drainage and noise mitigation; (j) monitoring and maintenance procedures for the built elements, rehabilitated vegetation and landscaping (including weed control). including performance indicators, responsibilities, timing and duration and contingencies where rehabilitation of vegetation and landscaping measures fail; and (k) evidence of consultation with the relevant council and community on the proposed urban design and landscape measures prior to its finalisation. The Plan may be submitted in stages to suit the staged construction program of the SSI.	All	All	Pre-construction and Construction	RMS and Contractor	For sections 1 & 2, An Urban Design and Landscape Plan that addresses this condition has been submitted and approved by the Department of Planning & Environment on the **8/5/15**
D21	The Applicant shall prepare and implement an Ancillary Facilities Management Plan to detail the management of ancillary facilities associated with the SSI. The Plan shall be prepared in consultation with the EPA, OEH, DPI (Fisheries), DoE, and the relevant council, and to the satisfaction of the Environmental Representative, and shall include, but not necessarily be limited to: (a) a description of the ancillary facility (including a site layout plan), its components and details of the existing environment on and in the vicinity of the site; (b) details of the activities to be carried out at the facility, including the hours of operation, staging of operation and predicted date of commissioning; (c) a description of the plant, equipment and materials to be used and/or stored on the site, including dangerous and hazardous goods; (d) details of the light and heavy construction vehicle movements to and from each facility, including site access and route(s) to be used during the establishment and operation of the facility, and an assessment of potential construction traffic impacts on the local road network and access tracks; (e) a summary of the potential environmental impacts associated with the construction and operation of the facility; (f) demonstrate compliance with the locational and environmental criteria in condition B73(a)—B73(n); (g) details of the mitigation, monitoring and management procedures specific to the facility that would be implemented to minimise environmental and amenity impacts or, where this is not possible, feasible and reasonable measures to offset these impacts; (h) a description of how the management and mitigation measures set out in the documents listed in condition A2 will be implemented on the site, and if not, justification for such decisions particularly on those sites assessed as having a high risk of flood impacts; (i) an assessment of alternative site layouts where either noise management levels are predicted to be exceeded and acoustic treatment of residences is not proposed, or where such treatment is proposed (consequent to the operational impacts of the SSI) but will not be provided prior to establishment of an ancillary facility; (j) a cumulative noise impact statement for the ancillary facility addressing the worst-case cumulative noise impacts resulting from the concurrent operation of the site (including construction traffic movements to and from the site), nearby construction works within the SSI corridor and any other nearby construction activities associated with other road upgrade projects; (k) identification of the timing for the completion of activities at the facility and how the site will be decommissioned (including any necessary rehabilitation); and (l) mechanisms for the monitoring, review and amendment of this plan. The plan shall be approved by the Environmental Representative prior to the establishment of the ancillary facilities described therein. In considering the approval of the plan, the Environmental Representative shall take into account the Applicant's response to public authority and council comments on the plan. The Applicant may prepare a separate plan for the facility or include multiple sites within a single or multiple management plans.	All	All	Pre-construction and Construction	RMS and Contractor	An Ancillary Facilities Management Plan that addresses this condition will be prepared for each package of works under Stage 1. The Ancillary MP for Sections 1 & 2 were approved by the ER , with each ancillary facility comprising a separate sub plan to the overarching approved document with approval from the ER. AFMP Sub plans have been developed and approved for Kangaroo Trail Rd, Taylors Run Batch Plant and Hawthorn Close Ancillary Facility.
D22	The Applicant shall prepare and implement a Borrow Sites Management Plan, to manage the construction, operation and rehabilitation of the borrow sites used to source construction material for the SSI, prior to the commencement of construction at the borrow sites, or as otherwise agreed by the Secretary. The Plan shall be prepared in consultation with the EPA, OEH and DPI (Fisheries) and to the satisfaction of the Secretary, and shall include, but not necessarily be limited to: (a) details of construction/extraction methods and activities carried out at the borrow site; (b) management and mitigation measures to be used to minimise surface and groundwater impacts, Aboriginal and non-Aboriginal heritage, air quality, noise and vibration, biodiversity and visual impacts; (c) consultation with sensitive receivers; and (d) details of the rehabilitation of the borrow site, including future landform and use of the borrow site, landscaping and revegetation, and measures that would be implemented to minimise or manage the ongoing environmental effects of the site. The Plan shall demonstrate that the construction and operation of the Lang Hill borrow site has no adverse impact on the known Oxleyan Pygmy Perch habitat waterway.	5, 6, 8, 10	Stage 2	Construction	Contractor	NA

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
D23	Prior to the commencement of construction of the SSI, or as otherwise agreed by the Secretary, the Applicant shall nominate for the approval of the Secretary a suitably qualified and experienced Environmental Representative(s) that is independent of the design and construction personnel. The Applicant shall employ the Environmental Representative(s) for the duration of construction, or as otherwise agreed by the Secretary. The Environment Representative(s) shall: (a) be the principal point of advice in relation to the environmental performance of the SSI; (b) monitor the implementation of environmental management plans and monitoring programs required under this approval and advise the Applicant upon the achievement of these plans/programs; (c) have responsibility for considering and advising the Applicant on matters specified in the conditions of this approval, and other licences and approvals related to the environmental performance and impacts of the SSI; (d) ensure that environmental auditing is undertaken in accordance with the Applicant's Environmental Management System(s); (e) be given the authority to approve/reject minor amendments to the Construction Environment Management Plan. What constitutes a "minor" amendment shall be clearly explained in the Construction Environment Management Plan; (f) be given the authority to approve/reject Out of Hours Works in accordance with condition B17. These works shall be conducted in accordance with the Out of Hours Works Protocol (OOHW Protocol) required in accordance with condition D26(vi); (g) be given the authority to approve/reject ancillary facilities in accordance with conditions B73 and B74 and the Ancillary Facilities Management Plans under condition D21; (h) be given the authority and independence to require reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse impact on the environment be likely to occur; and (i) be consulted in responding to the community concerning the environmental performance of the SSI where the resolution of points of conflict between the Applicant and the community is required	All	All	Pre-construction	RMS	Daniel Saunders from SMEC was the Environmental Representatives that was appointed for Stage 1 W2B. Back up ER's have also been approved by the Department of Planning and Environment. Murray Curtis from Environmental Resource Management is the Environmental Representative approved by teh Dept of Planning and Environment for both Stage 1 and Stage 2 of the W2B Project
D24	The Environmental Representative shall prepare and submit to the Secretary a monthly report on the Environmental Representative's actions and decision on matters specified in condition D23 for the preceding month. The reports shall be submitted for the duration of construction of the SSI, unless otherwise agreed by the Secretary.	All	All	Pre-construction and Construction	RMS	Noted.
D25 (a)-(c)	The Applicant shall prepare and implement (following approval) a Construction Environmental Management Plan for the SSI, prior to the commencement of construction, or as otherwise agreed by the Secretary. The Plan shall be prepared in consultation with the EPA, OEH, DPI (Fisheries), NOW and DoE and outline the environmental management practices and procedures that are to be followed during construction, and shall be prepared in consultation with the relevant government agencies and in accordance with the Guideline for the Preparation of Environmental Management Plans (Department of Infrastructure, Planning and Natural Resources, 2004). The Plan shall include, but not necessarily be limited to: (a) a description of activities to be undertaken during construction of the SSI (including staging and scheduling); (b) statutory and other obligations that the Applicant is required to fulfil during construction, including approvals, consultations and agreements required from authorities and other stakeholders under key legislation and policies; (c) a description of the roles and responsibilities for relevant employees involved in the construction of the SSI, including relevant training and induction provisions for ensuring that employees, including contractors and sub-contractors, are aware of their environmental and compliance obligations under these conditions of approval;	All	All	Pre-construction and Construction	Contractor	Utilising the approved Template CEMP, a Construction Environmental Management Plan shall be prepared and implemented (following approval by the Secretary) for each package of works under Stage 1, prior to the commencement of construction. The Section 1 CEMP was approved on the 15 May 2015 The Section 2 CEMP was approved on 4 June 2015.
D25 (d)	(d) an environmental risk analysis to identify the key environmental performance issues associated with the construction phase and details of how environmental performance would be managed and monitored to meet acceptable outcomes, including what actions will be taken to address identified potential adverse environmental impacts (including any impacts arising from the staging of the construction of the SSI). In particular, the following environmental performance issues shall be addressed in the Plan: (v) measures to monitor and manage dust emissions including dust from stockpiles, blasting, traffic on unsealed public roads and materials tracking from construction sites onto public roads; (vi) measures to minimise hydrology impacts, including measures to stabilise bed and bank structures as required; (vii) measures for the handling, treatment and management of contaminated materials; (viii) measures to monitor and manage waste generated during construction including but not necessarily limited to: general procedures for waste classification, handling, reuse, and disposal; use of secondary waste material in construction wherever feasible and reasonable; procedures or dealing with green waste including timber and mulch from clearing activities; and measures for reducing demand on water resources (including potential for reuse of treated water from sediment control basins); (ix) measures to monitor and manage spoil, fill and materials stockpile sites including details of how spoil, fill or material would be handled, stockpiled, reused and disposed in a Stockpile Management Protocol. The Protocol shall include details of the locational criteria that would guide the placement of temporary stockpiles, and management measures that would be implemented to avoid/minimise amenity impacts to surrounding residents and environmental risks (including surrounding water courses). Stockpile sites that affect heritage, threatened species, populations or endangered ecological communities require the approval of the Secretary, in consultation with the EPA, OEH and DPI (Fisheries); (x) measures to monitor and manage hazard and risks including emergency management and management measures to address potential risks to the Woodburn borefield drinking water catchment. These measures shall be developed in consultation with Rous Water; (xi) the issues identified in condition D26; (xii) details of community involvement and complaints handling procedures during construction, consistent with the requirement of conditions C1 to C4; (xiii) details of compliance and incident management consistent with the requirements of condition D27; and (xiv) procedures for the periodic review and update of the Construction Environmental Management Plan and Plans required under condition D26, as necessary (including where minor changes can be approved by the Environmental Representative). The Plan shall be submitted for the approval of the Secretary no later than one month prior to the commencement of construction, or as otherwise agreed by the Secretary. The Plan may be prepared in stages, however, construction works shall not commence until written approval of the relevant stage has been received from the Secretary. The approval of a Construction Environmental Management Plan does not relieve the Applicant of any requirement associated with this SSI approval. If there is an inconsistency with an approved Construction Environmental Management Plan and the conditions of this SSI approval, the requirements of this SSI approval shall prevail.	All	All	Pre-construction and Construction	Contractor	Utilising the approved Template CEMP, a Construction Environmental Management Plan will be prepared and implemented (following approval by the Secretary) for each package of works under Stage 1, prior to the commencement of construction. The Section 1 CEMP was approved on the 15 May 2015 The Section 2 CEMP was approved on 4 June 2015.

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
D26 (a)	As part of the Construction Environmental Management Plan for the SSI, the Applicant shall prepare and implement: (a) a Construction Noise and Vibration Management Plan to detail how construction noise and vibration impacts will be minimised and managed. The Plan shall be developed in consultation with the EPA and shall be consistent with the guidelines contained in the Interim Construction Noise Guidelines (DECC, 2009) and shall include, but not necessarily be limited to: (i) identification of sensitive receivers and relevant construction noise and vibration goals applicable to the SSI stipulated in this approval; (ii) details of construction activities and an indicative schedule for construction works; including the identification of key noise and/or vibration generating construction activities (based on representative construction scenarios, including at ancillary facilities) that have the potential to generate noise and/or vibration impacts on surrounding sensitive receivers, particularly residential areas; (iii) identification of feasible and reasonable measures proposed to be implemented to minimise and manage construction noise and vibration impacts (including construction traffic noise impacts); (iv) procedures and mitigation measures to ensure relevant vibration and blasting criteria are achieved, including a suitable blast program, applicable buffer distances for vibration intensive works, use of low-vibration generating equipment/vibration dampeners or alternative construction methodology, and pre- and post-construction dilapidation surveys of sensitive structures where blasting and/or vibration is likely to result in damage to buildings and structures (including surveys being undertaken immediately following a monitored exceedances of the criteria); and (v) a description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be conducted, the locations where monitoring would take place, how the results of this monitoring would be recorded and reported, and, if any exceedances is detected, how any non-compliance would be rectified; (vi) an out-of-hours work (OOHW) protocol for the assessment, management and approval of works outside of standard construction hours as defined in condition B15, including a risk assessment process under which the Environmental Representative may approve out-of-hour construction activities. The OOHW protocol shall detail standard assessment, mitigation and notification requirements for high and low risk out-of-hour works, consultation procedures with the EPA, the relevant council and affected landowners; (i) procedures for notifying sensitive receivers of construction activities that are likely to affect their noise and vibration amenity, as well as procedures for dealing with and responding to noise complaints; (vii) a program for construction noise and vibration monitoring clearly indicating monitoring frequency, location, how the results of this monitoring would be recorded and, procedures to be followed where exceedances of relevant noise and vibration goals are detected; and (viii) mechanisms for the monitoring, review and amendment of this plan.	All	All	Pre-construction and Construction	Contractor	Utilising the approved Template CEMP, a Construction Environmental Management Plan shall be prepared and implemented (following approval by the Secretary) for each package of works under Stage 1, prior to the commencement of construction. The Section 1 CEMP and associated Management Plans were approved on the 15 May 2015. The Section 2 CEMP and associated Management Plans were approved on 4 June 2015.
D26 (b)	(b) a Construction Traffic and Access Management Plan to manage construction traffic and access impacts of the SSI. The Plan shall be developed in consultation with the relevant council and shall include, but not necessarily be limited to: (i) identification of construction traffic routes and construction traffic volumes (including heavy vehicle/spoil haulage) on these routes; (ii) details of vehicle movements for construction sites and site compounds including parking, dedicated vehicle turning areas, and ingress and egress points; (iii) identification of construction impacts that could result in disruption of traffic, public transport, pedestrian and cycle access, property access, including details of oversize load movements; (iv) details of management measures to minimise traffic impacts, including temporary road work traffic control measures, onsite vehicle queuing and parking areas and management measures to minimise peak time congestion and measures to ensure safe pedestrian and cycle access; (v) details of measures to manage traffic movements, parking, loading and unloading at ancillary facilities during out-of-hours work; (vi) a response plan which sets out a proposed response to any traffic, construction or other incident; and (vii) mechanisms for the monitoring, review and amendment of this plan.	All	All	Pre-construction and Construction	Contractor	Utilising the approved Template CEMP, a Construction Environmental Management Plan shall be prepared and implemented (following approval by the Secretary) for each package of works under Stage 1, prior to the commencement of construction. The Section 1 CEMP was approved on the 15 May 2015 The Section 2 CEMP was approved on 4 June 2015.
D26 (c)	(c) a Construction Soil and Water Quality Management Plan to manage surface and groundwater impacts during construction of the SSI. The Plan shall be developed in consultation with the EPA, DPI (Fisheries), NOW, Rous Water (in relation to the Woodburn borefield), DoE and the relevant council and include, but not necessarily be limited to: (i) details of construction activities and their locations, which have the potential to impact on water courses, storage facilities, stormwater flows, and groundwater; (ii) surface water and ground water impact assessment criteria consistent with Australian and New Zealand Environment Conservation Council (ANZECC) guidelines or relevant site specific baseline data collected for known Oxleyan Pygmy Perch waterways; (iii) management measures to be used to minimise surface and groundwater impacts, including details of how spoil and fill material required by the SSI will be sourced, handled, stockpiled, reused and managed; erosion and sediment control measures; salinity control measures and the consideration of flood events; (iv) a Groundwater and Soil Salinity report should geotechnical investigations determine the presence, extent and severity of soil salinity within the SSI boundary, The report shall detail the outcomes of geotechnical investigations and identify and mitigate impacts to groundwater resources; (v) an Acid Sulfate Soils contingency plan, consistent with the Acid Sulfate Soils Manual, to deal with the unexpected discovery of actual or potential acid sulfate soils, including procedures for the investigation, handling, treatment and management of such soils and water seepage; (vi) a tannin leachate management protocol to manage the stockpiling of mulch and use of cleared vegetation and mulch filters for erosion and sediment control; (vii) an Oxleyan Pygmy Perch habitat waterway management framework to detail the measures and construction methods that will be employed to avoid direct discharge of construction water to known Oxleyan Pygmy Perch habitat waterways and downstream impacts to suitable habitat; (viii) management measures for contaminated material and a contingency plan to be implemented in the case of unanticipated discovery of contaminated material during construction; (ix) a description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be undertaken, the locations where monitoring would take place, how the results of the monitoring would be recorded and reported, and, if any exceedances of the criteria is detected how any non-compliance can be rectified; and mechanisms for the monitoring, review and amendment of this plan.			Pre-construction and Construction	Contractor	Utilising the approved Template CEMP, a Construction Environmental Management Plan shall be prepared and implemented (following approval by the Secretary) for each package of works under Stage 1, prior to the commencement of construction. The Section 1 CEMP was approved on the 15 May 2015 The Section 2 CEMP was approved on 4 June 2015.

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
D26 (d)	(d) a Construction Heritage Management Plan to detail how construction impacts on Aboriginal and non-Aboriginal heritage will be minimised and managed. The Plan shall be developed in consultation with the OEH, the NSW Heritage Council (for non-Aboriginal heritage) and Registered Aboriginal Parties (for Aboriginal heritage), and include, but not necessarily be limited to: (i) in relation to Aboriginal Heritage: (A) details of further investigation and identification of Aboriginal cultural heritage sites within the SSI boundary; (B) details of management measures to be carried out in relation to Aboriginal heritage, including a detailed methodology and strategies for protection, monitoring, salvage, and conservation, of sites and items associated with the SSI; (C) procedures for dealing with previously unidentified Aboriginal objects (excluding human remains) including cessation of works in the vicinity, assessment of the significance of the item(s) and determination of appropriate mitigation measures including when works can re-commence by a suitably qualified archaeologist in consultation with Department of Planning and Environment, OEH and Registered Aboriginal Parties and assessment of the consistency of any new Aboriginal heritage impacts against the approved impacts of the SSI, and registering of the new site in the OEH's Aboriginal Heritage Information Management System (AHIMS) register; (D) procedures for dealing with human remains, including cessation of works in the vicinity and notification of Department of Planning and Environment, NSW Police Force, OEH and Registered Aboriginal Parties and not recommencing any works in the area unless authorised by the OEH and/or the NSW Police Force; (E) heritage training and induction processes for construction personnel (including procedures for keeping records of inductions) and obligations under the conditions of this approval including site identification, protection and conservation of Aboriginal cultural heritage; and (F) procedures for ongoing Aboriginal consultation and involvement for the duration of the SSI; and (ii) in relation to non-Aboriginal Heritage: (A) identification of heritage Items directly and indirectly affected by the SSI; (B) details of management measures to be implemented to prevent and minimise impacts on heritage items (including further heritage investigations, archival recordings and/or measures to protect unaffected sites during construction works in the vicinity); (C) details of monitoring and reporting requirements for impacts on heritage items; (D) procedures for dealing with previously unidentified heritage objects, (including cessation of works in the vicinity, assessment of the significance of the item(s) and determination of appropriate mitigation measures including when works can re-commence by a suitably qualified and experienced archaeologist in consultation with the OEH, NSW Heritage Council and Department of Planning and Environment, and assessment of the consistency of any new heritage impacts against the approved impacts of the SSI; and (E) heritage training and induction processes for construction personnel (including procedures for keeping records of inductions and obligations under this approval including site identification, protection and conservation of non-Aboriginal cultural heritage; and (iii) mechanisms for the monitoring, review and amendment of this plan.	All	All	Pre-construction and Construction	Contractor	Utilising the approved Template CEMP, a Construction Environmental Management Plan shall be prepared and implemented (following approval by the Secretary) for each package of works under Stage 1, prior to the commencement of construction. The Section 1 CEMP was approved on the 15 May 2015 The Section 2 CEMP was approved on 4 June 2015.
D26 (e)	(e) a Construction Flora and Fauna Management Plan to detail how construction impacts on ecology will be minimised and managed. The Plan shall be prepared by a suitably qualified and experienced ecologist and developed in consultation with the OEH, DPI (Fisheries) and DoE, and shall include, but not necessarily be limited to: (i) details of pre-construction surveys undertaken by a suitably qualified and experienced ecologist to verify the SSI footprint based on detailed design; (ii) plans for impacted and adjoining areas showing vegetation communities; important flora and fauna habitat areas; locations where threatened species, populations or ecological communities have been recorded; including pre-clearing surveys to confirm the location of threatened flora and fauna species and associated habitat features; (iii) the identification of areas to be cleared and details of management measures (such as fencing, clearing procedures, removal and relocation of fauna during clearing, habitat tree management and construction worker education) to avoid any residual habitat damage or loss and to minimise or eliminate time lags between the removal and subsequent replacement of habitat; (iv) a protocol for the removal and relocation of fauna during clearing, including provision for engagement of a suitably qualified and experienced ecologist to identify locations where they would be present; to oversee clearing activities and facilitate fauna rescue and re-location; and consideration of timing of vegetation clearing with consideration to the avoidance of clearing native vegetation during the breeding/nesting periods of threatened species, where feasible and reasonable; (v) details of general work practices and mitigation measures to be implemented during construction and operation to minimise impacts on native fauna and native vegetation (particularly threatened species and their habitats and EEC) not proposed to be cleared as part of the SSI, including, but not necessarily limited to: fencing of sensitive areas; measures for maintaining existing habitat features (such as bush rock and tree branches etc); seed harvesting and appropriate topsoil management; construction worker education; weed management (including controls to prevent the introduction or spread of Phytophthora cinnamomi and myrtle rust (Puccinia psidii s.l.); erosion and sediment control, including measures to at least maintain habitat values downstream; and progressive re-vegetation; (vi) rehabilitation details, including identification of flora species and sources, and measures for the management and maintenance of rehabilitated areas; (vii) weed management measures focusing on early identification, suppression and control of invasive weeds and effective management controls; (viii) a protocol for managing aquatic and terrestrial pest animal/invasive species and plant species, and pathogens; (ix) consideration of the Threatened Species Management Plans; (x) a description of how the effectiveness of these management measures would be monitored and linked to the monitoring undertaken as part of the Threatened Species Management Plans; (xi) a procedure for dealing with unexpected EEC/threatened species identified during construction, including cessation of work and notification of the OEH, DPI (Fisheries) and DoE, determination of appropriate mitigation measures in consultation with these agencies (including relevant re-location measures) and updating of ecological monitoring and/or biodiversity offset requirements; and (xii) mechanisms for the monitoring, review and amendment of this plan.	All	All	Pre-construction and Construction	Contractor	Utilising the approved Template CEMP, a Construction Environmental Management Plan shall be prepared and implemented (following approval by the Secretary) for each package of works under Stage 1, prior to the commencement of construction. The Section 1 CEMP was approved on the 15 May 2015 The Section 2 CEMP was approved on 4 June 2015.
D27	The Applicant shall prepare and implement a Compliance Tracking Program, to track compliance with the requirements of this approval, prior to the commencement of construction and operate from the date of its approval to a minimum of one year following commencement of operation, or as otherwise agreed by the Secretary. The Program shall be prepared for the approval of the Secretary, and include, but not necessarily be limited to: (a) provisions for the notification of the Secretary prior to the commencement of construction and prior to the commencement of operation of the SSI (including prior to each stage, where works are being staged); (b) provisions for periodic review of the compliance status of the SSI against the requirements of this approval; (c) provisions for periodic reporting of compliance status to the Secretary, including a Pre-Construction Compliance Report, prior to the commencement of construction, and a Pre-Operation Compliance Report prior to the commencement of operation. These reports may be staged to suit the staged construction/operation of the SSI; (d) a program for independent environmental auditing in accordance with ISO 19011:2003 - Guidelines for Quality and/or Environmental Management Systems Auditing; (e) mechanisms for recording environmental incidents during construction and actions taken in response to those incidents; (f) provisions for reporting environmental incidents to the Secretary and relevant public authorities during construction; (g) procedures for rectifying any non-compliance identified during environmental auditing, review of compliance or incident management; and (h) provisions for ensuring all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.	All	All	Pre-construction and Construction	RMS and Contractor	The Compliance Tracking Program for Stage 1 was approved by the Department of Planning & Environment on the **7/5/15.** The previsions for periodic reporting including a pre-construction compliance report is being met with this document with 6 monthly reports being provided to the Department of Planning and Environment in accordance with the approved Compliance Tracking Program. The Section 1 pre construction compliance tracking report was submitted on 5 June 2015. This is the 3rd 6 monthly Compliance Tracking Reprot for W2HC.

Ministers Condition Of Approval	Requirement	Section	Project Stage	Timing	Responsibility	Comment
D28	The Applicant shall undertake operational noise monitoring, to compare actual noise performance of the SSI against noise performance predicted in the review of noise mitigation measures required by condition D11, within 12 months of the commencement of operation of the SSI, or as otherwise agreed by the Secretary. The Applicant shall subsequently prepare an Operational Noise Compliance Report to document this monitoring. The Report shall include, but not necessarily be limited to: (a) noise monitoring to assess compliance with the operational noise levels predicted in the review of operational noise mitigation measures required under condition D11 and documents listed in condition A2; (b) a review of the operational noise levels in terms of criteria and noise goals established in the NSW Road Noise Policy 2011; (c) methodology, location and frequency of noise monitoring undertaken, including monitoring sites at which SSI noise levels are ascertained, with specific reference to locations indicative of impacts on sensitive receivers; (d) details of any complaints and enquiries received in relation to operational noise generated by the SSI between the date of commencement of operation and the date the report was prepared; (e) any required recalibrations of the noise model taking into consideration factors such as noise monitoring and actual traffic numbers and proportions; (f) an assessment of the performance and effectiveness of applied noise mitigation measures together with a review and if necessary, reassessment of feasible and reasonable mitigation measures; and (g) identification of additional feasible and reasonable measures to those identified in the review of noise mitigation measures required by condition D11, that would be implemented with the objective of meeting the criteria outlined in the NSW Road Noise Policy 2011, when these measures would be implemented and how their effectiveness would be measured and reported to the Secretary and the EPA. The Applicant shall provide the Secretary and the EPA with a copy of the Operational Noise Report within 60 days of completing the operational noise monitoring referred to in (a) above or as otherwise agreed by the Secretary. Note: • The audit may be staged to suit the staged operation of the SSI.	All	All	Operation	RMS	Noted for Sections 1 & 2
D29	Prior to the commencement of operation, the Applicant shall incorporate the SSI into existing environmental management systems administered by the Applicant and prepared in accordance with the AS/NZS ISO 14000 Environmental Management System series. If there is an inconsistency between the existing environmental management systems and the conditions of this SSI approval, the requirements of this SSI approval shall prevail.	All	All	Construction and Operation	RMS	Noted for Sections 1 & 2
D30	Within 12 months of the commencement of operation, and then as required by the Secretary, the Applicant shall commission and pay the full cost of an Independent Environmental Audit of the SSI. This audit shall: (a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary; (b) include consultation with the relevant agencies; (c) assess the environmental performance of the SSI and assess whether it is complying with the requirements in this approval, and any other relevant approvals (including any assessment, plan or program required under these approvals); (d) review the adequacy of any approved strategy, plan or program required under the abovementioned approvals; and (e) recommend measures or actions to improve the environmental performance of the SSI, and/or any strategy, plan or program required under these approvals. Note: • This audit team shall be led by a suitably qualified auditor, and include experts in biodiversity, noise and vibration, hydrology and any other fields specified by the Secretary. • The audit may be staged to suit the staged operation of the SSI.	All	All	Operation	RMS	Noted for Sections 1 and 2 Wave 1, 2 and 3 soft soil works do not involve the completion of an operational section of highway.
D31	Within 60 days of commissioning this audit, or as otherwise agreed by the Secretary, the Applicant shall submit a copy of the audit report to the Secretary and relevant public authorities, together with its response to any recommendations contained in the audit report.	All	All	Operation	RMS	Noted for Sections 1 and 2

COMPLIANCE TRACKING - Arrawarra Rest Area

Part	Requirement	Section	Timing	Responsibility	Comment
1.1	The Proponent shall carry out the project generally in accordance with the: a) Major Projects Application 06_0293; b) Coffs Harbour Highway Planning – Sapphire to Woolgoolga section - Environmental Assessment (volumes 1, 2 and 3), prepared by Connell Wagner Pty Ltd and dated November 2007; c) Coffs Harbour Highway Planning – Sapphire to Woolgoolga section – Environmental Assessment Submissions Report, prepared by Connell Wagner Pty Ltd and dated June 2008, including the revised Statement of Commitments contained therein; d) correspondence from the NSW Roads and Traffic Authority to the Department of Planning dated 29 October 2008 withdrawing the proposed Arrawarra Rest Area from the project; e) Modification Application dated 21 October 2009 (06_0293 MOD 1) and request for modification dated 20 October 2009; and f) Modification Application dated 22 January 2010 (06_0293 MOD 2), and request for modification dated 22 January 2010; g) Modification Application dated 15 July 2010 (06_0293 MOD 3), including correspondence from the RTA to the Department dated 29 August 2010; h) Modification Application dated 21 September 2010 (06_0293 MOD 4) and request for modification dated 22 September 2010; i) Modification Application and request for modification dated 23 November 2010 (06_0293 MOD 5); j) Modification Application and request for modification received by the department on 21 October 2011 and Response to Submissions dated 3 July 2012 (06_0293 MOD 6); and k) the conditions of this approval.	1	Pre-construction and Construction	RMS and Contractor	Mod 6 relates to the Arrawarra Rest Area. All other conditions primarily relate to the Sapphire to Woolgoolga (S2W) project generally. Each condition relevant to the rest area is listed below. Where conditions are relevant to the construction phase, they are included in G36.3.1.
1.9	The Proponent is permitted to establish and operate a rest area for light and heavy vehicles at Arrawarra, as generally described in the documents referred to under condition 1.1 (j) of this approval.	1	Pre-construction, Construction and Operation	RMS	A consistency review of the current rest area design was undertaken and approved. The design is in accordance with these conditions.
1.10	The potential future service centre does not form part of this approval and shall be subject to a separate approval process.	1	Operation	RMS	Noted.
2.17	Standard construction hours for the duration of construction are: a) 7:00am to 6:00pm Mondays to Fridays, inclusive; and b) 8:00am to 1:00pm Saturdays; and c) at no time on Sundays or Public Holidays. The following exceptions (without further approval) to standard construction hours apply: i. any works that do not cause construction noise to be audible at any sensitive receiver; or ii. for delivery of materials required outside these hours by the Police or other relevant authorities for safety reasons; or iii. where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.	1	Construction	Contractor	Where conditions are relevant to the construction phase, they are included in G36.3.1. The Woolgoolga to Halfway Ck CEMP, and in particular the Noise and Vibration Management Plan addresses these working hour constraints.
2.18	Certain construction activities (Out of Hours Works) may be allowed to occur outside the standard construction hours with the prior written approval of the Director-General. Requests for out of hours approval will be considered for construction activities which cannot be undertaken during standard construction hours for technical or other justifiable reasons and will be considered on a case by case or activity-specific basis. Any request for Out of Hours Works must be accompanied by: a) details of the nature and need for activities to be conducted during the varied construction hours; b) written evidence to the EPA and the Director-General that activities undertaken during the varied construction hours are justified, appropriate consultation with potentially affected receivers and notification of Council has been undertaken, issues raised have been addressed, and all feasible and reasonable mitigation measures have been put in place; and c) evidence of consultation with the EPA on the proposed variation in standard construction hours. Despite the above, Out of Hours Works may also occur where a process for considering the above on a case by case or activity specific basis by the Proponent, including factors a) to c) above, has been approved as part of a Construction Environment Management Plan or Construction Noise and Vibration Management Plan for this project.	1	Construction	Contractor	Where conditions are relevant to the construction phase, they are included in G36.3.1. The Woolgoolga to Halfway Ck CEMP, and in particular the Noise and Vibration Management Plan addresses these working hour constraints.
2.21	The construction noise objective for the project is to manage noise from construction (as measured by a LA10 (15minute) descriptor) so that it does not exceed the background LA90 noise level by: a) more than 20 dB(A) for a construction period of equal to or less than four weeks; b) more than 10 dB(A) for a construction period of greater than four weeks, but not exceeding 26 weeks; and c) more than 5 dB(A) for a construction period greater than 26 weeks. Any activities that could exceed the construction noise objectives specified under this condition shall be identified and managed in accordance with a Construction Noise and Vibration Management Plan specified under Condition 6.3 d) of this approval. If the noise from construction is substantially tonal or impulsive in nature (as described in Chapter 4 of the NSW Industrial Noise Policy), 5dB(A) shall be added to the measured construction noise level when comparing the measured noise with the construction noise objectives. The Proponent shall implement all reasonable and feasible noise mitigation measures with the aim of achieving the construction noise objective.	1	Construction	Contractor	Where conditions are relevant to the construction phase, they are included in G36.3.1. The Woolgoolga to Halfway Ck CEMP, and in particular the Noise and Vibration Management Plan addresses these working hour constraints.
2.35	The Proponent shall ensure that all lighting installed as part of the rest area is mounted, screened, and directed in such a manner so as to minimise light spillage and/or glare to surrounding land uses. The lighting shall be the minimum level of illumination necessary, and generally in accordance with the latest version of AS 4282 – 1997 Control of the Obtrusive Effects of Outdoor Lighting.	1	Pre-construction and Construction	RMS and Contractor	The lighting design for the rest area shall be verified and certified by the contractor in accordance with G1.26
2.36	During the detailed design phase of the rest area, consideration shall be given to the installation of a rainwater tank(s) and any associated plumbing works to flush amenities.	1	Pre-construction	RMS	A rainwater tank is included in the rest area design and will be plumbed to the toilet facilities.
2.37	The Proponent shall, prior to the commencement of construction, or unless otherwise agreed by the Director-General, prepare and implement a Landscape Plan for the rest area site. In preparing the Plan, the Proponent shall consult with Coffs Harbour City Council. The Plan shall detail landscaping measures to minimise the impacts of the rest area on receptors in the vicinity of the site. The Plan shall include, but not necessarily be limited to: a) details of noise mounds; b) details of landscaping, including swales and bioretention systems, to meet the outcomes of Scenario 2 as described in the Response to Submissions dated 3 July 2012; c) measures to monitor and maintain landscaping (including weed control) including responsibilities, timing, duration and contingencies where landscaping measures fail; and d) details of information boards, bicycle racks and other structures.	1	Pre-construction	RMS	A landscape plan has been prepared in accordance with these conditions. All landscape plans for sections 1 and 2 have been provided to Coffs Harbour City Council, however no response has been received. The ongoing maintenance of the rest area will be in accordance with the handover report and RMS's maintenance unit.
2.38	Conditions 6.2 and 6.3 may be satisfied through the submission of an addendum to the Construction Environment Management Plan and associated sub plans for the project to include the Arrawarra Rest Area. The updated plans shall be submitted for the approval of the Director-General no later than one month prior to the commencement of construction of the rest area, or within such period otherwise agreed by the Director-General. Construction of the rest area shall not commence until written approval has been received from the Director-General or nominee.	1	Pre-construction and Construction	RMS	The CEMP as associated plans were submitted to DP&E for approval on 1/05/15. These plans include the construction of the Arrawarra Rest Area.
2.39	Prior to the operation of the Arrawarra Rest Area, the proponent shall incorporate the rest area into the existing environmental management systems.	1	Construction and Operation	RMS	The ongoing maintenance of the rest area will be in accordance with the handover report and RMS's maintenance unit.
2.40	The Biodiversity Offset and Mitigation Package as required by condition 2.13 shall be updated to include vegetation cleared as a result of the construction of the Arrawarra Rest Area.	1	Construction and Operation	RMS	Offsetting of clearing associated with the Arrawarra Rest Area has been captured within the W2B Biodiversity Offset Strategy.

COMPLIANCE TRACKING - EPBC

Part	Requirement	W2B Section	Stage	Timing	Responsibility	Comment
1	The Staging Report as required by NSW approval condition A7 must be submitted to the Minister prior to the commencement of each of the proposed stage(s). In accordance with NSW approval condition A7, the Staging Report must outline how the proposal will be staged. The Staging Report must also outline the threatened species and communities, and migratory species impacted in each stage.	All	All	Pre-construction	RMS	Noted.
2	In order to minimise impacts to threatened species and communities, and migratory species, the approval holder must: a) Adhere to the clearance limits outlined in the NSW approval condition B1 b) Undertake pre-clearance surveys in accordance with NSW approval condition B5 c) Undertake all soil and water management measures in accordance with NSW approval condition B34 d) Design and construct any additional ancillary facilities in accordance with the requirements of NSW approval condition B73 to ensure that no impacts occur to threatened species and communities, and migratory species or their habitat.	All	All	Pre-construction and Construction	RMS and Contractor	Compliance is being achieved for a), b) , c) and d) CEMP, vegetation tracking registers, pre clearing checklists and qualified ecologists are being utilised to ensure and track compliance.
3	In order to minimise impacts to the Oxleyan Pygmy Perch, the approval holder must undertake the action in accordance with NSW approval conditions B7, B8, B9, B13, B40, B41 and B42.	3;11	Stage 2	Pre-construction and Construction	RMS and Contractor	Stage 2
4	In order to minimise impacts to the Giant Barred Frog, the approval holder must undertake the action in accordance with the requirements of NSW approval condition B39.	1, Sections within Stage 2	All	Pre-construction	RMS	For section 1, this has been addressed in detailed design to avoid impact to known GBFrog habitat. Frog fencing has been installed, reducing impacts on GBF and GTF, including additional lengths of frog fencing.
5	In order to ensure the long-term viability of the Ballina Koala population, the approval holder must engage a suitably qualified expert to undertake population viability modelling of the Ballina Koala population over a time period of no less than 50 years, taking into account the impacts resulting from the road upgrade in Section 10. This modelling should consider the current proposed route and any proposed avoidance or mitigation measures as appropriate.	10	Stage 2	Pre-construction	RMS	Stage 2
6	The approval holder must have the modelling required by Condition 5 peer reviewed by a second suitably qualified expert.	10	Stage 2	Pre-construction	RMS	This condition does not directly apply to the Section 1 works.
7	In addition to the Koala Management Plan(s) required by NSW approval conditions D8 and D9, to ensure that an unacceptable impact will not occur to the Ballina Koala population, the approval holder must submit for the Minister's approval, a Ballina Koala Plan no less than 3 months prior to commencement of Section 10. The Minister will only approve the plan and the commencement of Section 10 of the action, if the impacts to the Ballina Koala population are demonstrated to be acceptable within the Ballina Koala Plan. The Ballina Koala Plan must include: a) the modelling required by Condition 5 and the results of this modelling, and the peer review required by Condition 6 b) discussion of the future viability of the Ballina Koala population c) in the context of relevant environmental social and economic considerations, any additional avoidance, mitigation or offsets, beyond those required by the NSW approval conditions, proposed to minimise the impacts to the Ballina Koala population; and d) evidence that any additional avoidance and mitigation measures proposed have been considered in the modelling required in Condition 5. The approval holder must not commence Section 10 unless the Ballina Koala Plan has been approved by the Minister. The approved Plan must be implemented.	10	Stage 2	Pre-construction	RMS	Stage 2
8	The approval holder must develop a Koala Management Plan(s) pursuant to the requirements of NSW approval conditions D8 and D9 for each relevant stage(s). The Koala Management Plan must minimise impacts to the Koala to the satisfaction of the Minister and must be submitted to the Minister for approval. The relevant stage(s) cannot commence until the Koala Management Plan for that stage is approved by the Minister. The approved Plan(s) must be implemented.	All	All	Pre-construction	RMS	This plan is included within the FFMP. Only applicable to condition D8.
9	The Koala Management Plan, relevant to Section 10, must be consistent with the approved Ballina Koala Plan and can only be submitted to the Minister for approval after the Ballina Koala Plan has been approved by the Minister.	10	Stage 2	Pre-construction	RMS	Stage 2
10	Should further offsets be required in accordance with NSW approval condition 09(d)j or be proposed as part of the Ballina Koala Plan, these must be in accordance with the EPBC Offsets Policy.	10	Stage 2	Pre-construction	RMS	Stage 2
11	The approval holder must develop a Threatened Mammal Management Plan(s) pursuant to the requirements of NSW approval condition D8 for each stage impacting on the Spotted-tail Quoll and the Long-nosed Potoroo. The Threatened Mammal Management Plan must minimise impacts to the Spotted-tail Quoll and Long-nosed Potoroo to the satisfaction of the Minister and must be submitted to the Minister for approval. The relevant stage(s) cannot commence until the Threatened Mammal Management Plan for that stage is approved by the Minister. The approved Plan(s) must be implemented.	All	All	Pre-construction	RMS	Spotted Tailed Quoll is relevant to sections 1 and 2. The Threatened Mammal Management Plans for Sections 1 & 2 have been approved by the Department of Planning & Environment on the **7/5/15.** This plan is included within the FFMP.
12	The approval holder must develop a Threatened Flora Management Plan(s) pursuant to the requirements of NSW approval condition D8 for each stage impacting on EPBC Act listed flora species. The Threatened Flora Management Plan must minimise impacts to EPBC Act listed flora species to the satisfaction of the Minister and be submitted to the Minister for approval. The relevant stage(s) cannot commence until the Threatened Flora Management Plan for that stage is approved by the Minister. The approved Plan(s) must be implemented.	All	All	Pre-construction	RMS	The Threatened Flora Management Plan for Sections 1 & 2 was approved by the Department of Planning & Environment on the 5/5/15.This document is part of the FFMP.
13	The approval holder must develop a Connectivity Strategy(is) pursuant to the requirements of NSW approval conditions D2 for each stage impacting on Threatened species and ecological communities. The Connectivity Strategy must minimise impacts to Threatened species and ecological communities to the satisfaction of the Minister and must be submitted to the Minister for approval. Commencement of the relevant stage(s) cannot occur until the Connectivity Strategy for that stage is approved by the Minister. The approved strategy(is) must be implemented.	All	All	Pre-construction	RMS	The Connectivity Strategy was approved by the Department of Planning & Environment on the 11/5/15. This document is part of the FFMP. Connectivity measures are being implemented progressively during construction.

Part	Requirement	W2B Section	Stage	Timing	Responsibility	Comment
14	In order to minimise impacts to threatened species and communities, and migratory species, the approval holder must develop and implement all Frameworks, Strategies, Plans or Programs, in accordance with the requirements of the following NSW approval conditions: a) The Mitigation Framework required by NSW approval condition D1 b) The Connectivity Strategy required by NSW approval condition D2 and the requirements of NSW approval condition B12 c) The Threatened Species Management Plans required by NSW approval condition D8 and D9 d) The Construction Soil and Water Quality Management Plan required by NSW approval condition D26(c) e) The Construction Flora and Fauna Management Plan required by NSW approval condition D26(e) f) The Borrow Site Management Plan required by NSW approval condition D22 g) The Water Quality Monitoring Program required by NSW approval condition D12 h) The Ancillary Facilities Management Plan required by NSW approval condition D21.	All	All	Pre-construction and Construction	RMS and Contractor	These plans have been prepared and are part of the DPE approved CEMP/ FFMP.
15	The approval holder must prepare and implement a Biodiversity Offset Strategy and Biodiversity Offset Package that compensates for any residual significant impacts on threatened species and communities. The Biodiversity Offset Strategy and Biodiversity Offset Package must meet the requirements of the EPBC Offsets Policy and must be submitted to the Minister for approval.	All	All	Pre-construction and Construction	RMS	The Department of Planning & Environment approved an extension of time for the Biodiversity Offset Strategy until 3 months after the start of construction. The Biodiversity Offset Strategy was approved by the Department of Planning & Environment on the 6/1/16 The Biodiversity Offset Strategy was approved by the Department of the Environment the 7/1/16 RMS will prepare and implement (following approval) a Biodiversity Offset Package, within twenty-four months of approval of the Biodiversity Offset Strategy, or as otherwise agreed by the Secretary.
16	The Biodiversity Offset Strategy and Biodiversity Offset Package must be prepared in accordance with the requirements NSW approval conditions D3, D4 and D5.	All	All	Pre-construction and Construction	RMS	A project wide Biodiversity Offset Package will be prepared and updated as required. The Biodiversity Offset Strategy was approved by the Department of Planning & Environment on the 6/1/16 The Biodiversity Offset Strategy was approved by the Department of the Environment the 7/1/16
17	Commencement cannot occur until the Biodiversity Offset Strategy required by Condition 15 is approved by the Minister. Commencement of the relevant stage(s) cannot occur until the information required by NSW approval condition D4 is approved by the Minister.	All	All	Pre-construction and Construction	RMS	The Department of Planning & Environment approved an extension of time for the Biodiversity Offset Strategy until 3 months after the start of construction. The Biodiversity Offset Strategy was approved by the Department of Planning & Environment on the 6/1/16 The Biodiversity Offset Strategy was approved by the Department of the Environment the 7/1/16 RMS will prepare and implement (following approval) a Biodiversity Offset Package, within twenty-four months of approval of the Biodiversity Offset Strategy, or as otherwise agreed by the Secretary.
18	The Biodiversity Offset Package required by Condition 15 must be approved by the Minister and the approved Biodiversity Offset Package must be implemented within 24 months of the approval of the Biodiversity Offset Strategy.	All	All	Pre-construction and Construction	RMS	The Department of Planning & Environment approved an extension of time for the Biodiversity Offset Strategy until 3 months after the start of construction. The Biodiversity Offset Strategy was approved by the Department of Planning & Environment on the 6/1/16 The Biodiversity Offset Strategy was approved by the Department of the Environment the 7/1/16 RMS will prepare and implement (following approval) a Biodiversity Offset Package, within twenty-four months of approval of the Biodiversity Offset Strategy, or as otherwise agreed by the Secretary.
19	Any survey data collected for the project must be collected and recorded so as to conform to a reasonable standard such that it can be readily used by a third party or to data standards notified from time to time by the Department. When requested by the Department, the proponent must provide to the Department all species and ecological survey data and related survey information from ecological surveys undertaken for matters of national environmental significance. This survey data must be provided within 30 business days of request, or in a timeframe agreed to by the Department in writing. The Department may use the survey data for other purposes.	All	All	Pre-construction, Construction and Operation	RMS and Contractor	Noted.
20	Within 14 days after the commencement of the action, the approval holder must advise the Department in writing of the actual date of commencement.	All	All	Construction	RMS	Noted.
21	Within three months of every 12 month anniversary of the commencement of the action, the approval holder must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any Frameworks, Strategies, Plans, or Package as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the compliance report is published. The approval holder must continue to publish the report until such time as agreed in writing by the Minister.	All	All	Pre-construction, Construction and Operation	RMS	The first annual DoE compliance tracking report was published on the W2B Project Website on the 19th of August 2016 within 3 months of the 12 month anniversary as per Condition 21.
22	Upon the direction of the Minister, the approval holder must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.	All	All	Pre-construction, Construction and Operation	RMS	Noted.

Part	Requirement	W2B Section	Stage	Timing	Responsibility	Comment
23	If the approval holder wishes to carry out any activity otherwise than in accordance with Frameworks, Strategies, Plans, Report or Package required by Conditions 7, 8, 10, 11 , 12, 14, 15, 16 and 17, the approval holder must submit to the Department for the Minister's written approval a revised version of those Frameworks, Strategies, Plans, Report or Package. The varied activity shall not commence until the Minister has approved the revised plan or agreement in writing. The Minister will not approve a revised plan or agreement, unless the revised plan or agreement would result in an equivalent or improved environmental outcome. If the Minister approves the revised plan or agreement that plan or agreement must be implemented in place of the plan or agreement originally approved.	All	All	Pre-construction and Construction	RMS	Noted.
24	If the Minister believes that it is necessary or convenient for the better protection of listed threatened species or communities to do so, the Minister may request that the approval holder submit for the Minister approval, or make revisions to any Frameworks, Strategies, Plans, Package, or Program specified in the conditions and submit the revised Frameworks, Strategies, Plans, Package, or Program for the Minister's written approval. The approval holder must comply with any such request. The approved or revised approved Frameworks, Strategies, Plans, Package, or Program must be implemented. Unless the Minister has approved the revised management plans, then the approval holder must continue to implement the management plans originally approved, as specified in the conditions.	All	All	Pre-construction and Construction	RMS	Noted.
25	If, at any time after 5 years from the date of this approval, the approval holder has not substantially commenced the action, then the approval holder must not substantially commence the action without the written agreement of the Minister.	All	All	Pre-construction	RMS	Noted.
26	The approval holder must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the Frameworks, Strategies, Plans, or Package required by this approval, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media.	All	All	Pre-construction and Construction	RMS	The project has an extensive range of measures, including these compliance tables, checklists, inspections and audits to document compliance.
27	Unless otherwise agreed to in writing by the Minister, the approval holder must publish all Frameworks, Strategies, Plans, or Package referred to in these conditions of approval on their website. Each management plan must be published on the website within 1 month of being approved.	All	All	Pre-construction and Construction	RMS	Approved Plans published on the RMS Project Web site.

COMPLIANCE TRACKING - ENVIRONMENTAL MITIGATION MEASURES
Woolgoolga to Ballina SSI-4963

Transport Roads & Maritime Services

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
Aboriginal Heritage							
SPIR-AH1	Aboriginal Cultural Heritage	Where artefact concentrations per square metre (over all depths) encountered are 50 per cent greater than previously encountered, additional salvage excavation using hand tools will be undertaken. If these artefact concentrations are encountered during machine excavation, then machine excavation will stop within 20 metres of the artefact concentrations. Up to, but no more than, an additional six square metres will be excavated in this situation at that site, unless rare features are encountered, in which case discussions with the registered Aboriginal stakeholders and NSW Office of Environment and Heritage will be undertaken to agree on a suitable approach.	All	All	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	The methodologies proposed by RPS Group and Navin Officer Heritage Consultants incorporated actions to take if substantially rich deposits of artefacts are located. These actions go over and above the requirements of this Management Measure.
SPIR-AH2	Aboriginal Cultural Heritage	For areas avoided by construction, exclusion zones will be put in place. These will be fenced with high visibility construction webbing or other similar fencing and have a 'Do Not Enter' sign. Exclusion zones will be marked on construction plans and be maintained until construction is completed. A representative of the Local Aboriginal Land Council will be present during establishment of the fencing.	All	All	Construction	Pacific Complete/ Contractor	Aboriginal Site Officers are present during the initial installation of the fencing but as agreed with the Lead Archaeologists RMS will send in surveyors to locate the fence more accurately on the project boundary.
SPIR-AH3	Aboriginal Cultural Heritage	If any part of the project (such as an ancillary facility) is located in an area which has not been subject to Aboriginal heritage field survey and assessment, an assessment will be undertaken before that part of the project proceeds.	All	All	Pre-construction	RMS/ Pacific Complete	Due diligence assessments are undertaken for all works that are proposed outside the SSI project boundary prior to such works being undertaken. The due diligence assessment informs the level of assessment that is required in each proposed area.
SPIR-AH4	Aboriginal Cultural Heritage	Salvage excavation and systematic collection of previously recorded artefacts that will be impacted by the project, along with any other impacted sites that are identified prior to or during construction, are to be undertaken by qualified archaeologists in conjunction with the registered Aboriginal stakeholders: The location of excavations will be within the area of the site to be impacted, and be decided upon in the field by a qualified archaeologist and registered Aboriginal stakeholders.	All	All	Pre-construction	RMS/ Pacific Complete/ Contractor	The methodologies proposed by RPS Group and Navin Officer Heritage Consultants go over and above the requirements of this Management Measure.
SPIR-AH5	Aboriginal Cultural Heritage	Heritage evidence collected will be curated in an appropriate manner, as determined in consultation with the registered Aboriginal stakeholders and the NSW Office of Environment and Heritage and in accordance with the National Parks and Wildlife Act 1974, details of the material's nature and context will also be provided.	All	All	Construction Post-construction	RMS/ Pacific Complete	This will be carried out during the analysis phase.
SPIR-AH6	Aboriginal Cultural Heritage	A detailed technical report documenting the results of the salvage excavations and the archaeological material analysis will be prepared. A summary report (to be made public) will be developed to accompany the technical report.	All	All	Construction Post-construction	RMS/ Pacific Complete	This will be carried out after the analysis phase.
SPIR-AH7	Aboriginal Cultural Heritage	Site records will be lodged with NSW Office of Environment and Heritage for any previously unrecorded evidence that is identified and for any evidence that is salvaged.	All	All	Construction	RMS/ Pacific Complete	This will be carried out on an on-going basis on the discovery of previously unrecorded Aboriginal Heritage evidence.
SPIR-AH8	Aboriginal Cultural Heritage	Aboriginal Site Impact Recording (ASIR) forms will be lodged with the Aboriginal Heritage Information Management Systems (AHIMS) Register within three months of sites being impacted.	All	All	Construction	Pacific Complete / Contractor	NA
SPIR-AH9	Aboriginal Cultural Heritage	An unexpected finds (including human skeletal remains) procedure will be developed in accordance with Roads and Maritime' Standard Management Procedures: Unexpected Archaeological Finds 2012.	All	All	Construction	Pacific Complete/ Contractor	The methodologies proposed by RPS Group and Navin Officer Heritage Consultants go over and above the requirements of this Management Measure for pre-construction works. This measure will be active during construction.
SPIR-AH10	Aboriginal Cultural Heritage	Aboriginal focus group consultation (through letters or meetings); will occur at least once every six months, prior to and during construction (unless management actions have been completed).	All	All	Pre-construction Construction	RMS/ Pacific Complete	An AFG for Woolgoolga to Wells Crossing was held on the 21 July 2015. An AFG for Wells Crossing to Iluka Road was held on the July 2015
SPIR-AH11	Aboriginal Cultural Heritage	Aboriginal culture awareness training for all relevant staff and contractors will occur prior to commencing work on-site. This could include information about the Aboriginal culture and history of the locality, the location of sites and items that require protection and movement corridors within the project boundary, heritage management measures and protocols, and legal obligations. This training will be developed in consultation with suitably trained personnel from local Aboriginal organisations represented by the relevant registered stakeholders for that area.	All	All	Pre-construction Construction	Pacific Complete/ Contractor	Heritage awareness training is included in Project Inductions, capturing all project workforce prior to commencing work on-site.
SPIR-AH12	Aboriginal Cultural Heritage	An Aboriginal heritage interpretation strategy will be prepared as part of the Aboriginal heritage management plan. Measures will include opportunities for promoting salvage and investigation, the recovery of information, permanent installations and ways of marking the presence of Aboriginal people in the landscape, including, signage, interpretation products such as written materials, and through place naming.	All	All	Pre-construction Construction	RMS/ Pacific Complete	Was proposed to be prepared by Roads and Maritime Environment Branch however still in development
SPIR-AH13	Aboriginal Cultural Heritage	Compliance auditing of the cultural heritage management measures will be undertaken as part of the environmental management audit regime.	All	All	Construction	Pacific Complete/ Contractor	Audits undertaken by RMS September 2015 and OHLY March & October 2015 with no deficiencies raised.

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-AH14a	Aboriginal Cultural Heritage	Ancillary facility - Section 1, Site 1a (at Taylors Run 2): • All previously recorded artefacts must be recovered and removed off-site, and passed to registered Aboriginal stakeholders for reburial or storage at a chosen location, subject to a care agreement being established. • If the Aboriginal archaeological site is not to be impacted, an exclusion zone will be established as per management measure AH2. Ancillary facility - Section 1, Site 1a (at Taylors Run 3): • Exclusion zones will be established as per management measure AH2. Ancillary facility - Section 1, Site 1a (at Taylors Run 1): • The surface scatter portion of this Aboriginal archaeological site outside the proposed ancillary facility will be avoided. An exclusion zone with a buffer of 15 metres of the surface artefact point will be established as per management measure AH2. • Any ground disturbance impacts to the archaeological site in the ancillary facility, will require the top soil down to the sterile clay layer to be graded, stockpiled separately (within a portion of the ancillary facility area), and reinstated at the same area following completion of the activity. • Any portions of the Aboriginal archaeological site not to be impacted will be protected by exclusion zones as per management measure AH2. Ancillary facility - Section 1, Site 1a (at WWC37 (22-1-0344)): • Within the Aboriginal archaeological site in the boundary of the project, after salvage activities, but before any other ground disturbance, the top soil down to the sterile clay layer will be graded from the area, stockpiled separately and used in batters (not fill) of the road/bridge. This will be undertaken in consultation with the relevant registered Aboriginal stakeholders and will be engaged to direct this activity. In addition: • The salvage to be excavated by machine is 30 % of the Aboriginal archaeological site. • The older house nearest to the river within the Aboriginal archaeological site will be removed, with minimal ground disturbance, before salvage excavations being undertaken, so that this area may be targeted for a portion of the salvage. • Their nominated site officers are present during removal of the plastic covering the blueberry bush rows, to identify artefacts on the surface under the plastic – an archaeologist will also be present to document finds. • All cultural material recovered will be subject to detailed analysis, which will be included in a technical report, including detailed discussion and interpretation. • Any portions of the Aboriginal archaeological site that are not to be impacted will be protected by exclusion zones as per management measure AH2.	1	Stage 1	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	All ancillary site requirements have been met, excluding WWC7, whereby a salvage strategy was submitted and approved b Department of Planning and Environment prior to use of this site.
SPIR-AH14b	Aboriginal Cultural Heritage	Ancillary facility - Section 1, Site 1a, 1b (at WWC39 (22-1-0343)): • If impact to WWC39 is necessary, salvage excavation of the portion of the Aboriginal archaeological site to be impacted will be undertaken as detailed in the Ancillary facility and design change CHAR (Appendix D of the Submissions/ Preferred Infrastructure Report) and in consultation with RAPs. • If impacts to the Aboriginal archaeological site are necessary, following archaeological salvage the top soil down to the sterile clay layer will be graded from the area, stockpiled separately and placed in batters. • Where ground disturbance is not necessary, geotextile fabric and crushed rock or similar will be used to protect the ground from compaction. • The area of the Aboriginal archaeological site not to be impacted will be protected by an exclusion zone as per management measure AH2.	1	Stage 1	Pre-construction	RMS/ Pacific Complete	Impact to WWC39 has only been within the approved project corridor. Salvage of WWC39 within the approved corridor was completed by RPS on 4 July 2015 with participation from representatives of the registered Aboriginal parties. No further salvage has been undertaken at WWC39. It was agreed by representatives from RMS, OHLY and members of the registered Aboriginal parties that any topsoil (down to sterile clay) which was required to be removed from within the approved project corridor following salvage would be stockpiled separately in a "mound" in front of Taylor's house. The representatives from the RAPs were concerned that if the topsoil was placed in batters, any artefacts would wash away over time.
SPIR-AH14c	Aboriginal Cultural Heritage	Ancillary facility - Section 1, Additional site 5: • Sub-surface test excavation will be undertaken prior to the use of the ancillary facility. This will be conducted in accordance with the methodology used in the working paper, and will occur several months before any ground disturbance in this location. Further recommendations for the Aboriginal archaeological site will then be made in consultation with the registered Aboriginal stakeholders.	1	Stage 1	Pre-construction	RMS/ Pacific Complete	Not being utilised
SPIR-AH14d	Aboriginal Cultural Heritage	Ancillary facility - Section 2, Site 1b (at Lemon Tree Road 1 (13-4-0180): • An exclusion zone will be established around this Aboriginal site as per management measure AH2.	2	Stage 1	Construction	Contractor	NA
SPIR-AH14e	Aboriginal Cultural Heritage	Ancillary facility - Section 2, Site 3 (at Kungala Road 1 (13-4-0181)): • Sub-surface test excavation will be undertaken prior to construction, conducted in accordance with the methodology used in the working paper, and occur several months before any ground disturbance at this location. Further recommendations for the Aboriginal archaeological site will then be made in consultation with the registered Aboriginal stakeholders, including potentially establishing a care agreement will be necessary to enable this. • Any portions of the Aboriginal archaeological site that are not to be impacted will be protected by exclusion zones as per management measure AH2.	2	Stage 1	Pre-construction Construction	RMS/ Contractor	NA
SPIR-AH14f	Aboriginal Cultural Heritage	Ancillary facility - Section 2, Site 4 (at Wells Crossing Artefacts 1 (13-4-0183): • If this Aboriginal archaeological site is to be impacted, salvage excavation of the portion of the Aboriginal archaeological site to be impacted will be undertaken as detailed in the Ancillary facility and design change CHAR (Appendix D of the Submissions/ Preferred Infrastructure Report) and in consultation with RAPs.	2	Stage 1	Pre-construction	RMS	NA
SPIR-AH14g	Aboriginal Cultural Heritage	Ancillary facility - Section 2, Site 5b (at WWC139 (13-4-0157)): • The Aboriginal archaeological site that is not to be impacted will be protected by exclusion zones as per management measure AH2.	3	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-AH14h	Aboriginal Cultural Heritage	Ancillary facility - Section 3, Site 3b (at WX2I Site 8 (09-4-0108)): • All previously recorded artefacts will be recovered and removed off-site before construction, subject to a care agreement being established. • All cultural material recovered will be subject to detailed analysis, which will be included in a technical report, including detailed discussion and interpretation.	3	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-AH14i	Aboriginal Cultural Heritage	Ancillary facility - Section 3, Site 6b (at Old Tucabia Dump 1 (13-4-0184)): • An exclusion zone will be established at the boundary of the Aboriginal archaeological site (including a buffer based on the drip zone of the tree) as per management measure AH2.	3	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-AH14j	Aboriginal Cultural Heritage	Ancillary facility - Section 3, Site 9 (at Upper Coldstream 1 (13-4-0182): • All previously recorded artefacts will be recovered and removed off-site, subject to a care agreement being established. • Any portions of the Aboriginal archaeological site not to be impacted will be protected by exclusion zones as per management measure AH2.	3	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/Contractor	NA
SPIR-AH14k	Aboriginal Cultural Heritage	Ancillary facility - Section 4, Site 1: • Sub-surface test excavations will be undertaken in accordance with the methodology used in the working paper, and will occur before any ground disturbance at this location. Further recommendations for the Aboriginal archaeological site will then be made in consultation with the registered Aboriginal stakeholders.	4	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-AH14l	Aboriginal Cultural Heritage	Ancillary facility - Section 4, Site 3: • This property could not be accessed for field investigations. Sub-surface test excavations are to be undertaken. This will be conducted in accordance with the methodology used in the working paper, and will occur before ground disturbing work for the project or ancillary activities being undertaken at this location. Further recommendations for the Aboriginal archaeological site will then be made in consultation with the RAPs.	4	Stage 2	Pre-construction	RMS/ Pacific Complete	NA

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-AH14m	Aboriginal Cultural Heritage	Ancillary facility - Section 4, Site 5 (at Hirst 3 (13-1-0192): • This Aboriginal archaeological site is to be avoided if possible unless agreement can be reached with the RAPs. An exclusion zone will be established as per management measure AH2. • If agreement to use the site is reached with RAPs, salvage excavation of the portion of the Aboriginal archaeological site to be impacted will be undertaken as detailed in the Ancillary facility and design change CHAR (Appendix D of the Submissions/ Preferred Infrastructure Report) and in consultation with RAPs.	4	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-AH14n	Aboriginal Cultural Heritage	Ancillary facility - Section 5, Site 7 (at Mororo Creek 1 (13-1-0191)): • This Aboriginal archaeological site within the ancillary facility location will be avoided. An exclusion zone at least five metres outside the boundary of the Aboriginal archaeological site will be established as per management measure AH2.	5	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-AH14o	Aboriginal Cultural Heritage	Ancillary facility - Section 5, Site 5 and Site 7 (at Mororo Creek 2 (13-1-0193): • This Aboriginal archaeological site within the ancillary facility location will be avoided. An exclusion zone at least five metres outside the boundary of the Aboriginal archaeological site will be established as per management measure AH2.	5	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-AH14p	Aboriginal Cultural Heritage	Ancillary facility - Section 7, Site 1: • A site walk over survey will be undertaken to confirm whether sub-surface test excavations are required. This will be conducted in accordance with the methodology used in the working paper, and will occur several months before any ground disturbance at this location. Further recommendations and use of the Aboriginal archaeological site will be developed in agreement with the registered Aboriginal stakeholders.	7	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-AH14q	Aboriginal Cultural Heritage	Ancillary facility - Section 7, Site 3 (Dubaijeen Site (New Italy 1): • Salvage excavation of the portion of the Aboriginal archaeological site to be used will be undertaken as detailed in the Ancillary facility and design change CHAR (Appendix D of the Submissions/ Preferred Infrastructure Report) and in consultation with RAPs. The excavations apply to the portion of the site that be impacted by the project as well as the ancillary facility. • Any portions of the Aboriginal archaeological site that are not to be impacted will be protected by exclusion zones as per management measure AH2.	7	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH14r	Aboriginal Cultural Heritage	Ancillary facility - Section 7, Site 4 (The Gap Rd 1(13-1-0194)): • If impact to The Gap Rd 1 is necessary, salvage excavation of the portion of the Aboriginal archaeological site to be impacted will be undertaken as detailed in the Ancillary facility and design change CHAR (Appendix D of the Submissions/ Preferred Infrastructure Report) and in consultation with RAPs. • Any portions of the Aboriginal archaeological site that are not to be impacted will be protected by exclusion zones will be established as per management measure AH2.	7	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH14s	Aboriginal Cultural Heritage	Ancillary facility - Section 10, Site 1a: • A site walk over survey will be undertaken to confirm whether sub-surface test excavation is required. This will be conducted in accordance with the methodology used in the working paper, and will occur several months before any ground disturbance at this location. Further recommendations for the Aboriginal archaeological site will then be made in consultation with the registered Aboriginal stakeholders.	10	Stage 2	Pre-construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH14t	Aboriginal Cultural Heritage	Ancillary facility - Section 10, ancillary facility 5At Rudgley Site 1 (04-4-0167): • This Aboriginal archaeological site will be avoided, where practical, using an exclusion zone as per management measure AH2. • If avoidance is not possible, salvage excavation of the portion of the Aboriginal archaeological site to be impacted will be undertaken as detailed in the Ancillary facility and design change CHAR (Appendix D of the Submissions/ Preferred Infrastructure Report) and in consultation with RAPs. • Any portions of the Aboriginal archaeological site that are not to be impacted will be protected by exclusion zones as per management measure AH2.	10	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH14u	Aboriginal Cultural Heritage	Ancillary facility - Section 10, Site 6 (Site 12 (11-2-0082)): • If avoidance is not possible, salvage excavation of all portions of the Aboriginal archaeological site to be impacted will be undertaken as detailed in the Ancillary facility and design change CHAR (Appendix D of the Submissions/ Preferred Infrastructure Report) and in consultation with RAPs. • Any portions of the Aboriginal archaeological site that are not to be impacted will be protected by exclusion zones as per management measure AH2.	10	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH14v	Aboriginal Cultural Heritage	Ancillary facility - Section 11, Site 1a: • The ground will be inspected for any Aboriginal archaeological material by an archaeologist and registered Aboriginal stakeholders during and following clearing activities. Any archaeological material will be recorded, removed from the Aboriginal archaeological site, and a suitable location for the material determined in consultation with the stakeholders. An AHIMS record will be submitted for any finds and any locations where the material is to be stored – unless reburied on or near Aboriginal archaeological site, establishing a care agreement will also be necessary.	11	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH15	Aboriginal Cultural Heritage	Salvage excavation will be undertaken within the portion of the site to be impacted by the project footprint as detailed in the Working paper Aboriginal Cultural Heritage (Woolgoolga to Wells Crossing) and in consultation with RAPs. An exclusion zone will be erected around 40% of the site that will be avoided by construction as per management measure AH2.	1	Stage 1	Pre-construction	RMS/ Pacific Complete	RPS Group are implementing the Approved Methodology.
SPIR-AH16	Aboriginal Cultural Heritage	Salvage excavation will be undertaken within the portion of the site to be impacted by the project footprint as detailed in the Working paper Aboriginal Cultural Heritage (Woolgoolga to Wells Crossing) and in consultation with RAPs.	1	Stage 1	Pre-construction	RMS/ Pacific Complete	RPS Group are implementing the Approved Methodology. WWC 46 A and B cleared and exclusion fencing installed
SPIR-AH17	Aboriginal Cultural Heritage	Prior to ground disturbance to WWC Dirty Creek 1c (22-1-0403), the ground surface be inspected within 50 m of the site for any Aboriginal archaeological material by an archaeologist and RAP nominated site officers. Any archaeological material be recorded, removed from the site, and a suitable location for the material determined in consultation with the RAPs. The AHIMS record will be updated with any new finds and any locations where the material is to be stored – unless reburied on or near site, establishing a care agreement be necessary.	1	Stage 1	Pre-construction	RMS/ Pacific Complete	RPS Group are implementing the Approved Methodology. WWC Dirty Creek 1C salvaged
SPIR-AH18	Aboriginal Cultural Heritage	Salvage excavation be undertaken within the portion of the site to be impacted by the project footprint as detailed in the Working paper Aboriginal Cultural Heritage (Wells Crossing to Iluka Road) and in consultation with RAPs.	4	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-AH19	Aboriginal Cultural Heritage	Chaffin Creek scarred tree (Chaffin Creek Tree 2): • Before construction, an exclusion zone will be established as per management measure AH2. An arborist will be consulted to develop a management strategy to ensure the health and preservation of the tree.	3	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-AH20	Aboriginal Cultural Heritage	Salvage excavation will be undertaken within the portion of the site to be impacted by the project footprint as detailed in the Working paper Aboriginal Cultural Heritage (Iluka Road to Woodburn) and in consultation with RAPs.	8	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-AH21	Aboriginal Cultural Heritage	For the Gittoes Jali (09-1-0204, 09-1-0205, 09-1-0203) site: • Where possible, impacts on the Gittoes Jali site will be reduced or avoided. Avoided areas will be protected by an exclusion fence as per management measure AH2. If avoidance is not an option, then extensive salvage will be undertaken as per the methodology detailed in the Ancillary facilities and design change CHAR (refer to Appendix D of the Submissions/ Preferred Infrastructure Report). • Any sediment from the site to 0.6 metre depth proposed to be used outside the site will be sieved to remove any cultural material. Paint wells and grinding rock: • Residue analysis will be undertaken to determine if any pigment is found within the wells. This will be undertaken by a suitably qualified consultant. • The location of these paint wells will be accurately plotted and drawn. • If the paint wells cannot be avoided, they will be relocated; this requires consultation with the registered Aboriginal stakeholders. Geomorphology assessment: • A geomorphology assessment will be undertaken. The assessment will be non-invasive, but could use observations of the machine salvage excavation. Borrow site: • Haul routes from the project formation to the borrow source that limit direct impacts to Aboriginal heritage will be confirmed in consultation with Registered Aboriginal Parties.	8	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-AH22	Aboriginal Cultural Heritage	For the EE/2 (13-1-01-00) site: • Salvage excavation will be undertaken at and around the shell midden by the project footprint as detailed in the Working paper Aboriginal Cultural Heritage (Woodburn to Ballina) and in consultation with RAPs. • Any sediment from the site to 1.5 m metre depth proposed to be used outside sites will be sieved to remove any cultural material. Shell Midden: • A sequence of dates (radiocarbon or AMS) will be collected from the hand excavation. • All shell recovered will be subject to analysis including minimum number of individuals (MNI) and weight (g). An analysis of the number of individual specimens (NISP) may	9	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH23	Aboriginal Cultural Heritage	For Site 11 (13-1-0189): • Salvage excavation will be undertaken by the project footprint as detailed in the Working paper Aboriginal Cultural Heritage (Woodburn to Ballina) and in consultation with RAPs. • Any sediment from the sites to 1.5 metre depth proposed to be used outside the site will be sieved to remove any cultural material. Geomorphology assessment: • A geomorphology assessment will be undertaken. The assessment will be non-invasive, but could use observations of the machine salvage excavation.	9	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH24	Aboriginal Cultural Heritage	For the Melino (04-4-0173) site: • Salvage excavation will be undertaken at the artefact scatter including a discrete knapping floor as detailed in the Working paper Aboriginal Cultural Heritage (Woodburn to Ballina) and in consultation with RAPs. • Any sediment from the sites to 1.5 metre depth proposed to be used outside the site will be sieved to remove any cultural material. Shell Midden: • Salvage excavations as detailed in the Working paper Aboriginal Cultural Heritage (Woodburn to Ballina) and in consultation with RAPs. • A sequence of dates (radiocarbon or AMS) will be collected from the hand excavation. • All shell recovered will be subject to analysis including minimum number of individuals (MNI) and weight (g). An analysis of the number of individual specimens (NISP) may also be undertaken if deemed appropriate. Area surrounding the shell midden: • Salvage excavations will be undertaken as detailed in the Working paper Aboriginal Cultural Heritage (Woodburn to Ballina) and in consultation with RAPs. Geomorphology assessment: • A geomorphology assessment will be undertaken. The assessment will be non-invasive, but could use observations of the machine salvage excavation.	10	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH25	Aboriginal Cultural Heritage	For Site 1 (04-4-0179): • Further salvage excavations will be undertaken as detailed in the Working paper Aboriginal Cultural Heritage (Woodburn to Ballina) and in consultation with RAPs. • Any sediment to one metre depth from the site proposed to be used outside the site will be sieved to remove any cultural material.	10	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH26	Aboriginal Cultural Heritage	For Site 2 (04-4-0178): • Salvage excavation will be undertaken as detailed in the Working paper Aboriginal Cultural Heritage (Woodburn to Ballina) and in consultation with RAPs. • Any sediment to 1.5 metres depth from the site proposed to be used outside the site will be sieved to remove any cultural material. • Excavation at Site 2 will be undertaken at a time of the year when the water table is at its lowest, to ensure maximum depth can be reached with a machine.	10	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH27	Aboriginal Cultural Heritage	For Site 3 (04-4-0175): • Further salvage excavations will be undertaken as detailed in the Working paper Aboriginal Cultural Heritage (Woodburn to Ballina) and in consultation with RAPs. • Any sediment to 1.5 metres depth from the site proposed to be used outside the site will be sieved to remove any cultural material. • Excavation at Site 3 will be undertaken at a time of the year when the water table is at its lowest, to ensure maximum depth can be reached with a machine.	10	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH28	Aboriginal Cultural Heritage	For Site 4 (04-04-0132): • Further salvage excavations will be undertaken as detailed in the Working paper Aboriginal Cultural Heritage (Woodburn to Ballina) and in consultation with RAPs. • Any sediment to 0.5 metre depth from the site proposed to be used outside the site will be sieved to remove any cultural material.	10	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH29	Aboriginal Cultural Heritage	For Site 12 (04-4-0176): • An exclusion zone be established at the boundary of the site where construction is to occur within 10 m of the site, as per management measure AH2.	10, 11	Stage 2	Pre-construction Construction	Pacific Complete/ Contractor	NA
SPIR-AH30	Aboriginal Cultural Heritage	For the Gumi site (04-4-0180): • The tree (registered on AHIMS database) will be removed and the trunk will be relocated to an area agreed to with the registered stakeholder groups and Roads and Maritime – an arborist will be consulted to guide in the removal of the tree. • The final tree location will be visually protected with culturally sensitive plantings or by existing vegetation. • Access to the tree will be provided for local Aboriginal people to enable them to be able to use the tree as a teaching site.	10	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH31	Aboriginal Cultural Heritage	For the Melino Scarred Tree 4 (04-4-0166) site: • Prior to construction a 15 metre exclusion zone will be established around the scarred tree as per management measure AH2. • An arborist will be consulted to develop an ongoing management strategy to ensure the preservation and health of the tree.	10	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH32	Aboriginal Cultural Heritage	For the MST3 (04-4-0131) site: • Prior to construction a 15 metre exclusion zone will be established around the scarred trees as per management measure AH2. • An arborist will be consulted to develop an ongoing management strategy to ensure the preservation and health of the tree.	10	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH33	Aboriginal Cultural Heritage	For the C21 (04-4-0107) site: • Prior to construction a 15 metre exclusion zone will be established around the scarred trees as per management measure AH2. • An arborist will be consulted to develop an ongoing management strategy to ensure the preservation and health of the tree.	10	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH34	Aboriginal Cultural Heritage	For the MSRT2 (04-4-0130) site: • Prior to construction a 15 metre exclusion zone will be established around the scarred trees as per management measure AH2. • An arborist will be consulted to develop an ongoing management strategy to ensure the preservation and health of the tree.	10	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH35	Aboriginal Cultural Heritage	For the Rudgley Scarred Tree (04-4-0170) site: • Prior to construction a 15 metre exclusion zone will be established around the scarred trees as per management measure AH2. • An arborist will be consulted to develop an ongoing management strategy to ensure the preservation and health of the tree.	10	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH36	Aboriginal Cultural Heritage	An exclusion zone will be established 5 metres from the boundary of Rudgley Scarred Tree 2 as per management measure AH2.	10	Stage 2	Pre-construction	Pacific Complete/ Contractor	NA

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-AH37	Aboriginal Cultural Heritage	The area of site to be impacted be subject to salvage excavation as detailed in the Addendum CHAR (Appendix D of the Submissions/ Preferred Infrastructure Report) and in consultation with RAPs. All cultural material recovered will be subject to detailed analysis, interpretation and reporting.	10	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-AH38	Aboriginal Cultural Heritage	Educational and cultural signage will be placed at viable locations along the highway in this locality, potentially describing the history of Aboriginal occupation of the area. At a minimum, signage will include acknowledging the area as the traditional lands of the Gumbaynggir peoples. Any signage will be subject to approval by the registered Aboriginal stakeholders.	1	Stage 1	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	This is being managed as part of site inductions using the training packages as per the approved Cultural Heritage Management Plan under the CEMP. Interpretation Signage to be included within the Arrawarra Rest Area.
SPIR-AH39	Aboriginal Cultural Heritage	Tyndale and Woodford Island Corridors of Movement: • Pedestrian access across the project will be provided, if reasonable and feasible within the existing local road network, to maintain the connectivity of this corridor of movement.	3	Stage 2	Pre-construction Detailed Design Construction	Pacific Complete/ Contractor	NA
SPIR-AH40	Aboriginal Cultural Heritage	Pillar Valley Corridors of Movement: • Pedestrian access across the project will be provided, if reasonable and feasible within the existing local road network, to maintain the connectivity of this corridor of movement.	3	Stage 2	Pre-construction Detailed Design Construction	Pacific Complete/ Contractor	NA
SPIR-AH41	Aboriginal Cultural Heritage	Place B: • To maintain connectivity, access will be provided across the project area, from the end of Richmond Road, Pine Tree Road, or Fischer Street to Broadwater National Park during construction and operation, in consultation with the traditional owners. • Pedestrian access within the project boundary will be provided, where feasible and reasonable from the eastern side of the project to the western side of Broadwater National Park. A connection from the existing Pacific Highway to Broadwater National Park along Eversons Lane be considered, in consultation with traditional owners and relevant land owners.	9, 10	Stage 2	Pre-construction Detailed Design Construction	Pacific Complete/ Contractor	NA
SPIR-AH42	Aboriginal Cultural Heritage	Place D: • Welcome to country signage will be installed within the highway corridor between Woodburn and Wardell and information on culture installed at the rest area in Section 10, as agreed with the registered Aboriginal parties.	9, 10	Stage 2	Pre-construction Construction	Pacific Complete/ Contractor	NA
SPIR-AH43	Aboriginal Cultural Heritage	Place K: • A geomorphological assessment will be undertaken, including the geomorphological setting of the archaeological sites within this landscape, and how the landscape has formed and changed over the last 40,000 years. This take into account both the cultural and scientific significance of the place. • A report will be produced by a geomorphologist in conjunction with an archaeologist / anthropologist.	11	Stage 2	Pre-construction Construction	Pacific Complete/ Contractor	NA
SPIR-AH44	Aboriginal Cultural Heritage	Place E: • This place will be fenced prior to and during construction to avoid incidental impact. • Surface water runoff from the construction site or from the highway pavement during operation of the project will be prevented from directly entering into Place E.	9	Stage 2	Pre-construction Construction	Pacific Complete/ Contractor	NA
SPIR-AH45	Aboriginal Cultural Heritage	Place C: • An education package will be prepared. This will include at a minimum a printed document detailing the story of the occupation of this area and the ensuing massacre. Further research and interviews will be undertaken for this purpose. Where possible, oral recordings and/or video footage will also be compiled into the package. • Caution will be undertaken in and around the project in this area with regard to potential human remains.	9, 10	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-AH46	Aboriginal Cultural Heritage	Before construction at Mororo Road, between station 97.45 and 98.9, a field inspection of the area to be cleared and excavated will be undertaken by an Aboriginal heritage consultant with Registered Aboriginal Parties.	6	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-AH47	Aboriginal Cultural Heritage	As the property occurs in an area of low-moderate Aboriginal heritage potential, survey, and if necessary test excavation, should be undertaken to determine the presence and extent of potential archaeological evidence. This will be conducted in accordance with the methodology agreed with RAPs, and prior to ground disturbing works for the project and/or proposed design change. Further recommendations for the site will then be made in consultation with the RAPs.	10	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-AH48	Aboriginal Cultural Heritage	The area of this site to be impacted will be subject to salvage excavation as detailed in the Addendum CHAR (Appendix D of the Submissions/ Preferred Infrastructure Report) and in consultation with RAPs. All cultural material recovered will be subject to detailed analysis, interpretation and reporting. The portion of the site that not be impacted (at least 70%), will be protected by fencing as per management measure AH2.	10	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
Air Quality							
SPIR-AQ1	Air Quality	An air quality management plan will be prepared and implemented by the contractor during construction to mitigate dust. The air quality management plan will address all aspects of construction including spoil handling, machinery operating procedures, soft soil treatments, stockpile management, traffic management, haulage, dust suppression and monitoring. The following dust mitigation measures will be used on-site and included as part of the management plan: • Covering materials transported to and from construction sites. • Covering or spraying water on stockpiles of soil or other potential dust generating materials, particularly during dry or windy conditions. • Temporarily seed and stabilise temporary stockpiles that are planned to be in place for long periods. • Imposing speed limits for vehicles and equipment travelling on unsealed surfaces. • Minimising the extent of disturbed areas as far as practicable. This will be achieved by staging the works to minimise the number of disturbed areas at any one time. • Progressively rehabilitating disturbed areas as soon as practicable. • Suppressing dust on unsealed surfaces, temporary roadways, stockpiles and other exposed areas using water trucks, hand held hoses, temporary vegetation and other practices. • Modifying or stopping dust generating activities during very windy conditions. • Installing wheel wash facilities at appropriate locations to reduce tracking of mud and soil off-site. • Monitoring air quality, both visually, using instrumentation and/or depositional dust gauges, near representative sensitive receptors to verify the effectiveness of controls. • Amend controls where necessary to minimise any impacts identified through monitoring, consider the use of mitigation measures (such as covers) where dust is impacting water tanks or other drinking water sources, and cannot be controlled at the dust source.	All	All	Construction	Pacific Complete/ Contractor	The Section 1 CEMP and associated Management Plans were approved on the 15 May 2015. The Section 2 CEMP and associated Management Plans were approved on the 4 June 2015.
Biodiversity							
SPIR-B1	Biodiversity	The Ecological Monitoring Program (Appendix K of the PIR) will be finalised in consultation with relevant State and Commonwealth agencies and incorporate any specific conditions of approval and feedback from the expert review.	All	All	Pre-construction	RMS	No Ecological Monitoring Program Required

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-B2	Biodiversity	The Connectivity Strategy will be further developed during detailed design, in consultation with relevant State and Commonwealth agencies, building upon the Connectivity Strategy in Appendix A of the Working paper – Biodiversity and the Supplementary Biodiversity Assessment in Appendix J of the Submissions / Preferred Infrastructure Report.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	The Connectivity Strategy for Sections 1 and 2 was approved by the Department of Planning & Environment on the 11/5/15. This document is part of the CEMP FFMP.
SPIR-B3	Biodiversity	All fauna connectivity structures will be developed in accordance with the design principles outlined in the Connectivity Strategy in Appendix A of the Working paper – Biodiversity and the Supplementary Biodiversity Assessment in Appendix J of the Submissions / Preferred Infrastructure Report.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	Completed as required in accordance with the approved Connectivity Strategy
SPIR-B4	Biodiversity	Opportunities for improved connectivity for koala and Long-nosed Potoroo will be further investigated between station 144.2 and station 146.6.	9 and 10	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-B5	Biodiversity	Fauna exclusion fencing locations and design will be further developed in accordance with the design principles outlined in the Connectivity Strategy in Appendix A of the Working paper – Biodiversity.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	Ongoing review and assessment of final treatment to ensure outcomes are in accordance with the approved Connectivity Strategy
SPIR-B6	Biodiversity	Fauna exclusion fencing in low-lying floodplains between stations 35.0 and 80.2 will where feasible and reasonable, be placed higher on fill embankments to reduce damage from flooding.	3 and 4	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-B7	Biodiversity	Tree height surveys will be conducted at proposed arboreal crossing zones to determine the most appropriate location to place rope or pole structures. Where feasible, the design will place arboreal crossing zones where average tree heights exceed 20 metres, and/ or taller trees are able to be safely retained close to the road edge.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	Completed for Sections 1 & 2 at widened median locations. Rope bridge within Section 2 was relocated slightly in consultation with the EPA to provide for a better connectivity outcome.
SPIR-B8	Biodiversity	The design and construction of fauna exclusion fencing, drainage or fauna underpass structures in widened medians minimise vegetation clearing.	1, 2 and 7	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer/ Contractor	Ongoing review and assessment of final treatment to ensure outcomes are in accordance with the approved Connectivity Strategy
SPIR-B9	Biodiversity	Where feasible and reasonable, native vegetation forming part of the identified widened medians will not be disturbed for any ancillary construction purpose including access tracks, stockpiles, materials lay down and ancillary facilities.	1, 2 and 7	All	Construction	Pacific Complete/ Contractor	Where ever possible this measure has been adopted.
SPIR-B10	Biodiversity	A Flora and Fauna Management Plan will be prepared in accordance with Roads and Maritime Biodiversity Guidelines – Protecting and managing biodiversity on RTA projects (RTA, 2011a).	All	All	Pre-construction	Pacific Complete/ Contractor	The Section 1 CEMP and associated Management Plans were approved on the 15 May 2015. The Section 2 CEMP and associated Management Plans were approved on the 4 June 2015.
SPIR-B11	Biodiversity	The threatened species management plans prepared for the project will be finalised, as relevant to the element of the project to be constructed. Development of the plans will include responding, where feasible and reasonable to: • Recommendations from expert review undertaken as part of the Submissions / Preferred Infrastructure Report (and detailed in section 1.4 of the management plans). • Any conditions of approval. • Results from baseline monitoring undertaken. The threatened species management plans will be finalised in consultation with the relevant State and Federal government agencies.	All	All	Pre-construction	RMS/ Pacific Complete	The Threatened Flora Management Plan for Sections 1 & 2 was approved by the Department of Planning & Environment on the **5/5/15.** The Threatened Mammal Management Plan for Sections 1 & 2 was approved by the Department of Planning & Environment on the **12/5/15.** The Threatened Frog Management Plan was approved by the Department of Planning & Environment on the **7/5/15.** The Threatened Glider Management Plan was approved by the Department of Planning & Environment on the **5/5/15.** The Threatened Bat Management Plan for Sections 1 & 2 was approved by the Department of Planning & Environment on the **29/9/14.** The Koala Management Plan for Sections 1 & 2 was approved by the Department of Planning & Environment on the **11/5/15.**These documents are part of the FFMP.
SPIR-B12	Biodiversity	A landscape management plan will be developed to provide specific details for the re-establishment of native vegetation on batters, cut faces, surrounding sediment basins and other areas disturbed during construction. This includes details for the appropriate removal and restoration of temporary creek crossings. The landscape management plan will be developed in line with Roads and Maritime Biodiversity Guidelines (RTA, 2011a), the design principles identified in the Connectivity Strategy and the design principles in Working paper – Urban design, landscape character and visual impact.	All	All	Pre-construction	RMS/ Pacific Complete	The Urban Design Landscape Plan was approved by the Department of Planning & Environment on the **8/5/15**
SPIR-B13	Biodiversity	Disturbance and clearing of vegetation will be minimised, particularly: • Avoiding and minimising vegetation removal wherever possible through the detailed design process. • Placing water quality basins in the optimal location for treating surface runoff. During detailed design, the location of water quality treatment measures will consider minimising vegetation removal, particularly where there is the potential for threatened plant species, threatened fauna habitat or in identified regional wildlife corridors.	All	All	Pre-construction Detailed Design Construction	Pacific Complete/ Contractor	Design and clearing limits have been focused on minimising clearing wherever possible during detailed design. This is a key objective during the detailed design. The contractor will minimise clearing during construction and ensure compliance with the approved clearing quantities as per MCoA B1. Section 1 has achieved vegetation savings include some riparian species including savings to EEC and threatened species.
SPIR-B14	Biodiversity	In stream structures such as bridges and culverts will be designed and managed to minimise any potential impact to flow regimes and fish passage, in accordance with Fairfull and Witheridge (2003).	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer/ Contractor	This has been completed utilising input from DPI / EPA
SPIR-B15	Biodiversity	following locations: • Unnamed waterway station 114.0 • Oaky Creek station 122.5 • Nortons Gully station 123.6 • Unnamed waterway station 133.4 • Unnamed waterway at station 134.7 • Tributary of Macdonalds Creek at station 135.5 • Montis Gully tributary at station 141.8	7 and 8	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-B16	Biodiversity	All drainage structures between stations 134.5 to 143.0 will be reviewed in consultation with Department of Primary Industries (Fisheries) to ensure suitable connectivity for threatened fish species is maintained.	8 and 9	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer/ Contractor	NA
SPIR-B17	Biodiversity	Each permanent waterway crossing is to be designed to ensure no physical, hydraulic and behavioural barriers to aquatic fauna movements. Impacts be minimised by ensuring that: • The natural stream flow and velocity are maintained as closely as possible. • Surface level of any causeway is the same or lower than the natural stream bed to reduce interference with flow. • Habitat within a culvert is as natural as possible (eg allow rock and bed materials to infill the culvert base). • There is the maximum light penetration. • Fauna and fish passage standards are maintained, as detailed in the Connectivity Strategy, including minimum design widths, including for natural banks, while also providing for scour protection and cut and fill batters. • Bridges will be designed and sized to ensure peak flood velocities are not increased by more than one metre per second than the existing flood event, where Oxleyan Pygmy Perch have been confirmed.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	This has been completed utilising input from DPI / EPA

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-B18	Biodiversity	Bridge structures will be designed to minimise impacts to flow regimes and fish passage. Where feasible and reasonable the following principles will apply: • Bridge piers to be located outside the main channel. • Bridge structures to be designed to prevent an increase of backup of water during times of flood that will enable Plague Minnow to access waterbodies where they are currently not found (eg Broadwater National Park). • Construction not alter or reduce flow where there are existing or potential Oxleyan Pygmy Perch populations (primarily within Sections 7, 8 and 9).	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	For Sections 1 & 2, bridge structure design has been completed in accordance with these principals
SPIR-B19	Biodiversity	Where temporary access tracks are required over drainage lines with no flow, fords may be installed.	All	All	Detailed Design Construction	Contractor	Noted
SPIR-B20	Biodiversity	Where possible, existing crossings will be used. Where this is not feasible or reasonable, the temporary crossings will be designed to minimise impacts on the existing aquatic ecology and water quality.	All	All	Construction	Pacific Complete/ Contractor	Existing crossings have been utilised where ever possible as a priority to minimise disturbance to waterways.
SPIR-B21	Biodiversity	Temporary waterway access track mitigation measures include: • Installation and subsequent decommissioning of temporary crossings will be undertaken outside of Oxleyan Pygmy Perch spawning seasons (October to December), where Oxleyan Pygmy Perch have been confirmed. • Temporary crossings will be constructed from clean fill using pipe or box culvert cells to carry flows. • All temporary works (eg crossings, flow diversion barriers) will be removed as soon as practicable and in a way that does not promote future channel erosion. • The preferred temporary structure for crossing waterways will be consistent with Witheridge (2002). • Scour protection works will be established at temporary crossings as required. • At the completion of construction, the temporary crossings will be removed and rehabilitated.	All	All	Detailed Design Construction	Pacific Complete/ Contractor	Temporary Crossings Designed in consultation with ERG, including these provisions. Note - all temporary crossings have now been removed from Section 1.
SPIR-B22	Biodiversity	Fish that become stranded due to temporary access crossings or construction of temporary or permanent creek diversions must be captured and translocated following the Department of Primary Industries Fisheries Guidelines – A Guide to Acceptable Procedures and Practices for Aquaculture and Fisheries Research.	All	All	Construction	Contractor	Noted. All dams have been dewatered by a fully qualified aquatic ecologist in accordance with the dam dewatering procedure which was commended by Fisheries.
SPIR-B23	Biodiversity	The pre-clearing process will be consistent with Roads and Maritime Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA projects (RTA, 2011a) and include: • Pre-clearing surveys by an experienced ecologist for large bird nests, particularly for listed species such as the Black-necked Stork, Eastern Osprey, Square-tailed Kite and Little Eagle during the nesting and breeding season (July to December) and tree roosting (eg Southern Myotis)or cave dwelling bats in trees or existing culvert/bridge structures. If the species is present in or directly adjacent to the project footprint (including ancillary facilities), measures to manage any species be considered, if required. • Mapping the location of any threatened flora and/or fauna species, Threatened Ecological Communities and habitat. • Construction traffic will be restricted to defined access tracks, fenced prior to the start of construction and maintained until construction is complete.	All	All	Pre-construction Construction	Pacific Complete/ Contractor	Included in approved Construction Flora and Fauna Management Plan
SPIR-B24	Biodiversity	The location of exclusion zones will be identified, with temporary fencing or flagging tape to indicate the limits of clearing (in accordance with the Roads and Maritime Biodiversity Guidelines (RTA, 2011a)). Permanent fauna exclusion fencing for the project (as described in the Connectivity Strategy), where reasonable and feasible, will be installed prior to clearing and can function as exclusion fencing.	All	All	Construction	Pacific Complete/ Contractor	Implemented in accordance with approved Construction Flora and Fauna Management Plan
SPIR-B25	Biodiversity	A staged habitat removal process will be implemented consistent with the Roads and Maritime Biodiversity Guidelines (RTA, 2011a).	All	All	Construction	Pacific Complete/ Contractor	Implemented in accordance with approved Construction Flora and Fauna Management Plan
SPIR-B26	Biodiversity	Woody debris and bushrock will be re-used on site for habitat improvement where possible and will be detailed in the landscape management plan in accordance with the Roads and Maritime Biodiversity Guidelines (RTA, 2011a).	All	All	Construction	Contractor	Implemented in accordance with approved Construction Flora and Fauna Management Plan
SPIR-B27	Biodiversity	A weed management plan will be developed as part of the CEMP, in accordance with the Roads and Maritime Biodiversity Guidelines (RTA, 2011a) and the Introductory Weed Management Manual (Richards, 2004).	All	All	Pre-construction Construction	Pacific Complete/ Contractor	Included as Appendix in approved Construction Flora and Fauna Management Plan
SPIR-B28	Biodiversity	A site assessment by an ecologist or person trained in weed identification will be undertaken to identify the presence and extent of Alligator weed. If present, management measures in the Weed Management Plan will be in accordance with the Department of Primary Industries Alligator Weed control manual (van Oosterhout, 2007).	7, 8. 9 10	Stage 2	Pre-construction	Pacific Complete	Included as Appendix in approved Construction Flora and Fauna Management Plan
SPIR-B29	Biodiversity	Measures to prevent the introduction and/or spread of pests and disease causing agents such as bacteria and fungi will be incorporated into the CEMP, in accordance with the Roads and Maritime Biodiversity Guidelines (RTA, 2011a).	All	All	Pre-construction Construction	Pacific Complete/ Contractor	Included as Appendix in approved Construction Flora and Fauna Management Plan
SPIR-B30	Biodiversity	If pathogens are identified on site: • Testing may be required to confirm the presence of pathogens. • Advice from government departments will be sought on practical hygiene management measures. • Fenced exclusion zones will be identified to restrict access into contaminated areas.	All	All	Construction	Pacific Complete/ Contractor	Included as Appendix in approved Construction Flora and Fauna Management Plan
SPIR-B31	Biodiversity	Nest boxes be installed as per Roads and Maritime Biodiversity Guidelines (RTA, 2011a) and a nest box strategy developed as part of the CEMP, detailing: • The number and type of nest boxes required based on the number, quality and size of the hollows that be removed. • Specifications for nest box dimensions, installation requirements, locations of nest boxes and ongoing monitoring and maintenance. • Installation timeframes, including the installation of 70 % of nest boxes prior to the removal of any vegetation in the vicinity of the hollows.	All	All	Pre-construction Construction	Pacific Complete	The Nest Box Plan for Sections 1 & 2 was approved by the Department of Planning & Environment on the **17/2/15.** 100% of nest boxes have been installed in accordance with the requiremetns of the approved nest box management plan.
SPIR-B32	Biodiversity	To prevent injury and mortality of fauna during the clearing of vegetation and drainage of farm dams, an experienced and licensed wildlife carer and/or ecologist will be present to capture and relocate fauna where required. Further details regarding fauna handling and vegetation clearing procedures are provided in the Roads and Maritime Biodiversity Guidelines (RTA, 2011a).	All	All	Construction	Pacific Complete	Project ecologists who are fully qualified and experienced ecologists were onsite at all times to relocate any fauna, including attend to any injured fauna. The project have completed clearing with minimal fauna fatalities. A qualified vet is also on standby during construction in Woolgoolga.
SPIR-B33	Biodiversity	Prior to any disturbance of waterway banks, a thorough inspection by a qualified ecologist will be undertaken for aquatic fauna such as turtle nests.	All	All	Construction	Pacific Complete/ Contractor	Ecologist pre-inspection undertaken in accordance with approved CFFMP.
SPIR-B34	Biodiversity	Where possible, streams will be crossed perpendicular to flow, with crossing sites selected to avoid unstable banks, bends in the channel, deep pools and confluences with other channels.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	This has been completed utilising input from DPI / EPA
SPIR-B35	Biodiversity	The bed and banks are to be reinstated to a condition similar to or better than the original condition ensuring that there are no adverse impacts on the aquatic values (different measures may be required for each crossing) and where feasible and reasonable, avoid impacts on geomorphic processes.	All	All	Construction	Pacific Complete/ Contractor	Being implemented in consultation with ERG across the project.
SPIR-B36	Biodiversity	All construction materials used for permanent watercourse crossings (rocks and gravel) are to be free of fine particles to minimise turbidity.	All	All	Construction	Pacific Complete/ Contractor	Being implemented in consultation with ERG across the project.
SPIR-B37	Biodiversity	Instream and riparian disturbance will be minimised and sediment, woody snags or debris removed from a stream or stream channel will be minimised. Trimming or 'lopping' of branches and logs will be considered as a first option before moving.	All	All	Construction	Pacific Complete/ Contractor	Where practical, instream and riparian disturbance has been minimised, salvaged and will be transplanted once practical.
SPIR-B38	Biodiversity	Any instream woody debris removed during construction will be replaced at the completion of the works within the same waterways from which it was removed, where feasible and reasonable.	All	All	Construction	Pacific Complete/ Contractor	Woody debris left in situ in Section 1 resulting in nil aquatic fauna impacts, in addition root balls have been salvaged from the project to provide additional aquatic habitat at crossings. This has been done in consolations with OEH and DPI
SPIR-B39	Biodiversity	Where feasible and reasonable within the road corridor, existing pools will be retained upstream and downstream of crossings within known habitat of the Oxleyan Pygmy Perch to provide resting and refuge habitat near crossing structures.	6, 7,8, 9	Stage 2	Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	Stage 2
SPIR-B40	Biodiversity	Appropriate plant species will be incorporated into the rehabilitation of disturbed aquatic habitats and drains as a result of construction.	All	All	Construction	Pacific Complete/ Contractor	The landscape plan will be implemented.
SPIR-B41	Biodiversity	All construction sediment and erosion control measures will be put in place during the construction process and may include sediment and erosion control curtains in the waterways to control turbidity generated during the construction and restoration process.	All	All	Construction	Pacific Complete/ Contractor	Prior to any creek works, silt curtains and hydrocarbons were installed in addition to other sediment controls around the waterway banks.
SPIR-B42	Biodiversity	No turbid water generated from the construction corridor or construction area is to be discharged to any waterway unless in accordance with relevant Environment Protection Licence conditions and developed in consultation with Environment Protection Agency and Department of Primary Industries (Fisheries).	All	All	Construction	Pacific Complete/ Contractor	Noted.
SPIR-B43	Biodiversity	No in-stream work will occur in known Oxleyan Pygmy Perch habitat during the Oxleyan Pygmy Perch spawning season (October to December inclusive) or within 24 hours of the commencement of any rainfall event (>10 millimetres).	6, 7,8, 9	Stage 2	Construction	Pacific Complete/ Contractor	NA

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-B44	Biodiversity	Operational spill basins are to be installed at key locations ie near Broadwater National Park and other key drainage lines that lead directly into threatened fish habitat.	All	All	Operation	Pacific Complete/ Contractor	Operational basins have been designed accordingly and in consultation with Fisheries and EPA.
SPIR-B45	Biodiversity	Chemicals and fuels will be appropriately stored and bunded, away from waterways and drainage lines.	All	All	Construction	Pacific Complete/ Contractor	Included in approved CSWMP
SPIR-B46	Biodiversity	Discharges from sediment basins and/or treatment wetlands located in Oxleyan Pygmy Perch habitat that do not meet the water quality parameters for Oxleyan Pygmy Perch (to be determined through pre-construction water quality monitoring) will not be discharged directly into waterways, with other methods or uses employed to discharge. This could include, but not be limited to: • Spraying onto adjacent open grass areas or used for construction purposes such as dust. • Treating the water to ensure the pH is between 5.0 and 6.5 and total suspended solids of less than 50 mg/L, before discharging, depending on environmental protection licensing requirements.	6, 7,8, 9	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B47	Biodiversity	Water quality monitoring will be undertaken to assess the effectiveness of (and where necessary amend) water, sediment and erosion management strategies that aim to protect native fish species, their habitat and other aquatic flora and fauna species. Water quality monitoring program be undertaken in line with details in Appendix B of the Working paper – Biodiversity.	All	All	Construction	Pacific Complete/ Contractor	The Water Quality Monitoring Program for Sections 1 & 2 was approved by the Department of Planning & Environment on the 8/5/15. OHLY are undertaking surface water quality monitoring & RMS continues to monitor groundwater levels and water quality in accordance with the approved Program.
SPIR-B48	Biodiversity	Where feasible and reasonable, stockpiles will be located above the 1:100 year flood level with appropriate management control measures in place such as bunding.	All	All	Construction	Pacific Complete/ Contractor	Included in approved CSWMP
SPIR-B49	Biodiversity	Specific management measures will be implemented to limit impacts from stockpiling of material for bridgeworks at known and potential areas of Oxleyan Pygmy Perch during the spawning seasons of October to December.	6, 7,8, 9	Stage 2	Construction	Pacific Complete/ Contractor	Stage 2
SPIR-B50	Biodiversity	Batch plants will be located at least 300 metres away from Oxleyan Pygmy Perch habitat where sediment erosion not runoff into waterways (due to the risk of high alkaline runoff).	7,8, and 9	Stage 2	Construction	Pacific Complete/ Contractor	Stage 2
SPIR-B51	Biodiversity	Ancillary facilities will be located in cleared or sparsely treed portions of the ancillary facility sites, and avoid unnecessary clearing of native vegetation.	All	All	Pre-construction Construction	Pacific Complete/ Contractor	For Sections 1 & 2, Ancillary Facilities were assessed against the B73 locational criteria and the A2 (d) document with one of the objecitves being to avoid Threatened Ecological Communities.
SPIR-B52a	Biodiversity	Ancillary facility - Section 2 site 1a: • Flag and avoid hollow bearing trees • Revegetation of the section of the site in the road reserve or the entire site (if practicable).	2	Stage 1	Construction	Pacific Complete/ Contractor	NA
SPIR-B52b	Biodiversity	Ancillary facility - Section 2 site 5a: • Avoid isolated trees and flag and avoid hollow bearing trees where possible. Site to remain cleared to benefit emus.	2	Stage 1	Construction	Pacific Complete/ Contractor	NA
SPIR-B52c	Biodiversity	Ancillary facility - Section 2 site 6a and 6b: • Site to remain clear (not vegetated) to benefit emus.	2	Stage 1	Construction	Pacific Complete/ Contractor	NA
SPIR-B52d	Biodiversity	Ancillary facility - Section 3 Site 1: • This compound site that was used for the Glenugie Upgrade and has been revegetated post-construction. A site inspection and survey is required prior to construction to determine its suitability for future use as an ancillary site. • Avoid mature trees. • Revegetation of the section of the site in the road reserve or the entire site (if practicable).	3	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52e	Biodiversity	Ancillary facility - Section 3 Site 2: • Provide a buffer of 50 metres minimum from creek and sediment fencing where required. • Avoid mature trees. • Revegetation of the section of the site in the road reserve or the entire site (if practicable).	3	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52f	Biodiversity	Ancillary facility - Section 3 Site 4: • Ancillary site to be restricted to the western parts of the site adjoining Wooli Road. • Vegetation in the road reserve along Wooli Road to be protected from disturbance. • The population of the Slender Screw Fern plants is to be avoided. • Existing trails or disturbed areas to be used for access to site. Bostock Road not to be used for access.	3	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52g	Biodiversity	Ancillary facility - Section 3 Site 8: • Identify and mark Angophora robur during pre-clearing and provide exclusion fencing.	3	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52i	Biodiversity	Ancillary facility - Section 3 Site 9: • Provide buffer to the surrounding forest. • Identify and mark Angophora robur during pre-clearing and provide exclusion fencing • Provide sediment fencing on eastern boundary where required. • Avoid and buffer koala feed trees in the northwest corner of the site. Buffer required from edge of the forest to reduce edge effects, sediment fencing where required.	3	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52j	Biodiversity	Ancillary facility - Section 5 Site 6: • Consult with OEH on future use of this site post-construction, which may have offset potential with assisted regeneration and could be considered as a potential addition to Mororo Creek Nature Reserve • Flag and buffer habitat patch on southern boundary.	5	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52k	Biodiversity	Ancillary facility - Section 5 Additional site 9: Provide buffer around Mororo Creek and sediment fencing to protect riparian areas Flag and buffer habitat patch on southern boundary	5	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52l	Biodiversity	Ancillary facility - Section 6 Site 3a and 3b: • Mark and avoid small dam in north-west corner of site and buffer activities from a large remnant patch adjoining to the north. • Avoid scattered mature trees where possible.	6	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52m	Biodiversity	Ancillary facility - Section 6 site 5: • Site is currently being used as a compound site for the Devils Pulpit upgrade. On completion of construction for that project, the site would be stabilised with a quick growing cover crop to stabilise the site. • A site inspection and survey is required prior to construction to confirm the suitability of the site. • Site to be rehabilitated post- construction.	6	Stage 2	Pre-construction Construction	Pacific Complete/ Contractor	NA
SPIR-B52n	Biodiversity	Ancillary facility - Section 7 Site 1: • To be used for only low risk activities, no chemical or fuel storage on site.	7	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52o	Biodiversity	Ancillary facility - Section 7 Site 2a and 2b: • To be used for only low risk activities, no chemical or fuel storage on site.	7	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52p	Biodiversity	Ancillary facility - Section 7 site 3: • Provide sediment fencing along eastern boundary.	7	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52q	Biodiversity	Ancillary facility - Section 7 Site 4: • Provide buffer of minimum 50 metres from the wetland on northern boundary and sediment fencing where required. Avoid tree removal where possible	7	Stage 2	Construction	Pacific Complete/ Contractor	NA

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-B52r	Biodiversity	Ancillary facility - Section 8 Site 2a, 2b and 2c: • Recommend use for stockpile only, no chemical or fuel storage on site.	8	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52s	Biodiversity	Ancillary facility - Section 8 Site 3: • Provide bunding around the site. No chemical storage.	8	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52t	Biodiversity	Ancillary facility - Section 9 Site 1: • Provide buffer and sediment fencing at southern end. • Provide sediment fencing at southern end of site, stockpiling only at northern half, no chemical storage	9	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52u	Biodiversity	Ancillary facility - Section 9 site 2: • Provide sediment fencing at southern end of site, stockpiling only at northern half, no chemical storage	9	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52v	Biodiversity	Ancillary facility - Section 9 site 3: • Provide sediment fencing at southern end of site, stockpiling only at northern half, no chemical storage	9	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52w	Biodiversity	Ancillary facility - Section 10 site 1b: • Revegetation of the section of the site in the road reserve or the entire site (if practicable).	10	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52x	Biodiversity	Ancillary facility - Section 10 site 3b: • Map and avoid strip of trees along northern boundary	10	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B52y	Biodiversity	Ancillary facility - Section 10 site 4: • Revegetate site post-construction, focus on approaches to land bridge and avoid Arthraxon hispidus.	10	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B53	Biodiversity	The project footprint in section 1 will to be reviewed to identify any opportunities to avoid significant impacts to the existing population.	1	Stage 1	Pre-construction	Pacific Complete/ Detailed Designer	The batters have been steepened up to reduce direct impact on Moonee Quassia
SPIR-B54	Biodiversity	The project footprint and placement of sedimentation basins will be evaluated to minimise impacts to Slender Screw Fern.	6	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-B55	Biodiversity	The Biodiversity Offset Strategy (detailed in Appendix C of the Working paper – Biodiversity) will be developed further, in consultation with relevant State and Commonwealth agencies, and implemented during detailed design.	All	All	Pre-construction Detailed Design	RMS/ Pacific Complete/ Detailed Designer	Department of Planning and Environment and Department of the Environment approved approved a variation for the submission of the Biodiversity Offset Strategy and Offset Status Report within 3 months of commencement of sections 1 and 2 and approval of the Biodiversity Offset Strategy and Offset Status Report prior to commencement of Stage 2 works. The Biodiversity Offset Strategy and Offset Status Report (D4) were both submitted as per the variation timeline. The Biodiversity Offset Strategy was approved by the Department of Planning & Environment on the 6/1/16 The Biodiversity Offset Strategy was approved by the Department of the Environment the 7/1/16 RMS will prepare and implement (following approval) a Biodiversity Offset Package, within twenty-four months of approval of the Biodiversity Offset Strategy, or as otherwise agreed by the Secretary.
SPIR-B56	Biodiversity	Street lighting on the western roundabout at the interchange at Wardell will be designed to reduce light spill during detailed design. This could include using deflection shields around the lights or using a UV light, with reduced UV light emissions.	10	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-B57	Biodiversity	Further investigation will be undertaken of the road runoff capture and storage to the east side of the existing Pacific Highway between station 158.2 and 159.4 to protect remaining in situ aquatic habitats south of Laws Road.	11	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-B58	Biodiversity	Roads and Maritime owned land surrounding the dedicated landbridge at station 156.0 be revegetated in accordance with the connectivity strategy and the landscape management plan.	10	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-B59	Biodiversity	The Lang Hill Environmental Management Work Statement be further developed and implemented during the use and rehabilitation of the borrow site.	8	Stage 2	Pre-construction Construction	Pacific Complete/ Contractor	NA
SPIR-B60	Biodiversity	The creekline on the 'Lang Hill' property will should be fenced off from cattle and the vegetation allowed to regenerate to improve the habitat conditions downstream.	8	Stage 2	Construction Operation	Pacific Complete/ Contractor	NA
SPIR-B61	Biodiversity	Detailed design will investigate measures to reduce impacts to Maundia triglochinoides: • Near Redbank Creek (population 14). • Near North of New Italy (population 12).	1, 7	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	For Section 1, Impacts to Maundia triglochinoides were based on designs that focused on minimising impacts to this species, and ensuring that impacts were in accordance with the approved Threatened Flora Management Plan.
Construction & Operational Noise & Vibration							
SPIR-CNV1	Noise & Vibration	Affected receivers will be notified prior to the commencement of out of hours work. Notification includes contact details of project personnel in charge of the out of hours works.	All	All	Construction	Pacific Complete/ Contractor	Addressed in the approved NVMP/ App D Out of Hours Work. Extended work hours have been approved at HC2G in accordance with the NVMP/ App D Out of Hours Work Procedure which implements the Conditions of MCoA B16 and EPL 20599, in particular B16 (d) and (e) and EPL L5.2 and L5.3. No complaints have been received regarding the approved extended hours to date.
SPIR-CNV2	Noise & Vibration	Construction will be timetabled to minimise noise impacts where feasible and reasonable. This may include time and duration restrictions and respite periods. These measures will be considered after consultation with affected receivers.	All	All	Construction	Pacific Complete/ Contractor	Included in approved Construction Noise and Vibration Management Plan
SPIR-CNV3	Noise & Vibration	Haulage routes will be located as far away as possible from residential receivers, where this is reasonable and feasible.	All	All	Construction	Pacific Complete/ Contractor	Included in approved Construction Noise and Vibration Management Plan
SPIR-CNV4	Noise & Vibration	Equipment will be maintained in efficient working order.	All	All	Construction	Contractor	Included in approved Construction Noise and Vibration Management Plan
SPIR-CNV5	Noise & Vibration	Quieter construction methods will be used, where there are sensitive receivers potentially affected and where this is considered reasonable and feasible. These may include grinding, rock splitting or terrain levelling instead of hydraulic rock breaking.	All	All	Construction	Contractor	Included in approved Construction Noise and Vibration Management Plan
SPIR-CNV6	Noise & Vibration	Where acceptable from a work health and safety perspective, quieter alternatives to reversing alarms (such as spotters, closed circuit television monitors and 'smart' reversing alarms) will be used, particularly during night-time activities.	All	All	Construction	Contractor	Included in approved Construction Noise and Vibration Management Plan
SPIR-CNV7	Noise & Vibration	All noise complaints received will be dealt with promptly. Construction methods may need to be altered to reduce noise impacts at the affected locations.	All	All	Construction	Pacific Complete/ Contractor	Included in approved Construction Noise and Vibration Management Plan
SPIR-CNV8	Noise & Vibration	Machinery will not be turned on prior to the work hours outlined in this EIS. This will include daily maintenance activities and/or 'warming up' of engines.	All	All	Construction	Contractor	Included in approved Construction Noise and Vibration Management Plan
SPIR-CNV9	Noise & Vibration	Truck movements will be restricted to identified haulage routes and the routes outlined in the Construction Traffic Management Plan.	All	All	Construction	Pacific Complete	Included in approved Construction Traffic Management Plan
SPIR-CNV10	Noise & Vibration	Where it has been identified as necessary (eg in response to community complaints), noise monitoring will be undertaken to check that the noise mitigation measures are effective.	All	All	Construction	Pacific Complete/ Contractor	Included in approved Construction Noise and Vibration Management Plan
SPIR-CNV11	Noise & Vibration	The use of temporary noise shielding will be considered at locations where substantial exceedances of noise criteria are predicted.	All	All	Construction	Pacific Complete/ Contractor	Included in approved Construction Noise and Vibration Management Plan
SPIR-CNV12	Noise & Vibration	Static noise sources, such as generators, pumps and lighting towers, will be located as far as possible from sensitive receivers.	All	All	Construction	Contractor	Included in approved Construction Noise and Vibration Management Plan

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-CNV13	Noise & Vibration	Regular noise monitoring will be undertaken during proposed construction hours at a representative receiver location, between: • 6am to 7pm, Monday to Friday. • 8am to 5pm, Saturday	All	All	Construction	Pacific Complete/ Contractor	Included in approved Construction Noise and Vibration Management Plan
SPIR-CNV14	Noise & Vibration	The selection of plant and equipment will be based on noise emission levels. This equipment will be operated and maintained so that noise emissions are minimised.	All	All	Construction	Contractor	Included in approved Construction Noise and Vibration Management Plan
SPIR-CNV15	Noise & Vibration	Where piling, hydraulic hammering or dynamic compaction is proposed within 50 metres of any structure or service, a building condition survey will be conducted and preliminary vibration monitoring undertaken by a qualified contractor.	All	All	Construction	Pacific Complete/ Contractor	Included in approved Construction Noise and Vibration Management Plan
SPIR-CNV16	Noise & Vibration	Where piling, hydraulic hammering or dynamic compaction is proposed within 50 metres of any heritage structure or potentially structurally unsound service, a building condition survey will be conducted and preliminary vibration monitoring undertaken by a qualified contractor. A follow-up survey will be conducted in response to any vibration complaints.	All	All	Construction	Pacific Complete/ Contractor	Included in approved Construction Noise and Vibration Management Plan
SPIR-CNV17	Noise & Vibration	Appropriately sized equipment will be selected to minimise vibration emissions, where required.	All	All	Construction	Contractor	Included in approved Construction Noise and Vibration Management Plan
SPIR-CNV18	Noise & Vibration	A blast management plan will be prepared prior to the start of blasting activities.	All	All	Pre-construction	Pacific Complete/ Contractor	Included in approved Blast Management Plan
SPIR-CNV19	Noise & Vibration	Where sensitive receivers are located close to the blast site, a series of trials will be undertaken at a reduced scale to determine site-specific blast response characteristics, to define allowable blast sizes to occur within the criteria.	All	All	Construction	Pacific Complete/ Contractor	Included in approved Blast Management Plan
SPIR-CNV20	Noise & Vibration	Controlled blasting activities will only be undertaken between the hours of: • 9am to 5pm, Monday to Friday. • 9am to 1pm, Saturday. These times may be increased with the written agreement of affected residents. Where the blast management plan has identified potential impacts on sensitive receivers, these hours will be subject to change.	All	All	Construction	Contractor	Included in approved Blast Management Plan
SPIR-CNV21	Noise & Vibration	A minimum of 24 hours' notice will be provided to all residences located within 500 metres of any blast, including an indication of blasting times and a contact name and telephone number.	All	All	Construction	Pacific Complete/ Contractor	Included in approved Blast Management Plan
SPIR-CNV22	Noise & Vibration	Monitoring of overpressure and vibration levels will be undertaken for each blast at the potentially most affected receivers.	All	All	Construction	Pacific Complete/ Contractor	Included in approved Blast Management Plan
SPIR-CNV23	Noise & Vibration	A building condition survey will be undertaken for all buildings located within 200 metres of the proposed blasting area prior to the start of blasting. The proponent will be responsible for rectifying any damage occurring from the blasting, with the cost to be borne by the proponent.	All	All	Construction	Pacific Complete/ Contractor	Included in approved Blast Management Plan
SPIR-CNV24	Noise & Vibration	Should blasting be required within 200 metres of the water reservoirs at the Lang Hill borrow source, a dilapidation or preconstruction condition survey will be undertaken before blasting work commences in consultation with Richmond Valley Council and Rous Water.	8	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-CNV25	Noise & Vibration	The maximum instantaneous charge (MIC) will be reduced to the lowest possible level by the use of delays, reduced diameter holes, and/or deck loading.	All	All	Construction	Contractor	Included in approved Blast Management Plan
SPIR-CNV26	Noise & Vibration	Adequate stemming will be provided and exposed detonating cord be eliminated (by covering with at least 300 millimetres of quarry dust or road base).	All	All	Construction	Contractor	Included in approved Blast Management Plan
SPIR-CNV27	Noise & Vibration	Secondary blasting will be eliminated. (A rock breaker or drop hammer will be used instead of popping). Effort will be made to eliminate the need for toe shots (eg by better control of drill patterns).	All	All	Construction	Contractor	Included in approved Blast Management Plan
SPIR-CNV28	Noise & Vibration	Weather conditions at the time of the blast will be assessed. Blasting will be avoided where possible during heavy cloud cover and/or if a strong wind is blowing towards residences. Days of severe temperature inversion will be avoided where possible or, (if not possible) blasting will occur between 11am and 1pm.	All	All	Construction	Pacific Complete/ Contractor	Included in approved Blast Management Plan
SPIR-CNV29	Noise & Vibration	Strict control will be exercised over the spacing and orientation of all blast drill holes. Holes will be spaced in such a manner that the explosive force is just sufficient to break the stone to the required size.	All	All	Construction	Contractor	Included in approved Blast Management Plan
SPIR-CNV30	Noise & Vibration	Controlled blasting times will be determined in consideration of site-specific conditions and in consultation with affected residents and take place, where possible, when impacts are likely to be the least intrusive (eg all blasts be fired at a set time acceptable to residents and preferably when the background noise is highest).	All	All	Construction	Contractor	Included in approved Blast Management Plan
SPIR-CNV31	Noise & Vibration	Identified receivers will be notified by letter of the proposed hours and asked for comment and feedback. This will include justification for the proposed extended working hours along with the benefits the community can expect. Where the community or individual residents wish to receiver further clarification on the proposed hours, individual interviews or public meetings will be organised to address any further issues. Discussions will be sufficiently detailed to provide a general summary of the expected impacts but also how this relates to individual receivers. At this stage, more detail will be available regarding the proposed construction activities to be undertaken in the extended hours. Property owners will be provided with the complaints management procedures to be in place for extended working hours. Feedback will be collected to help determine the final adopted working hours for the project, with community consultation continuing throughout the project.	All	All	Pre-construction	Pacific Complete/ Contractor	Addressed in the approved NVMP/ App D Out of Hours Work. Extended work hours have been approved at HC2G in accordance with the NVMP/ App D Out of Hours Work Procedure which implements the Conditions of MCoA B16 and EPL 20599, in particular B16 (d) and (e) and EPL L5.2 and L5.3. No complaints have been received regarding the approved extended hours to date during this reporting period.
SPIR-ONV1	Noise & Vibration	Architectural treatments will be considered for noise-affected receivers identified in the EIS and Submissions / Preferred Infrastructure Report (Appendix F), subject to confirmation at the detailed design stage.	All	All	Pre-operation Detailed Design	Pacific Complete/ Contractor	Ongoing with RMS currently at the scoping stage for noise affected receivers
SPIR-ONV2	Noise & Vibration	Low noise wearing surface will be implemented in areas identified in section 5.3.21 of the EIS.	1,3,4,5,8, and 10	All	Pre-operation Detailed Design	Contractor	This was completed as part of detailed design for Sections 1 & 2.
SPIR-ONV3	Noise & Vibration	No later than one year after commencement of operation of the project stages as they are constructed, Roads and Maritime will undertake operational noise monitoring to compare the actual noise performance of the project against predicted noise performance. The report will include, but not necessarily be limited to: • Noise monitoring to assess compliance with the operational noise levels predicted. • A review of the operational noise levels in terms of criteria and noise goals. • Methodology, location and frequency of noise monitoring undertaken. • Details of any complaints and enquiries received in relation to operational noise. • Any required recalibrations of the noise model. • An assessment of the performance and effectiveness of applied noise mitigation measures. • Any additional feasible and reasonable measures required.	All	All	Operation	RMS	Noted
Greenhouse Gas Emissions							
SPIR-GH1	Greenhouse Gas Emissions	Flyash content within concrete will be specified where feasible. Contractors will be required to propose recycled content construction materials where they are cost, quality and performance competitive.	All	All	Pre-construction Construction	Pacific Complete/ Contractor	Fly ash included in concrete mix designs where feasible.
SPIR-GH2	Greenhouse Gas Emissions	Reuse of excavated road materials will be maximised as far as possible where they are cost, quality and performance competitive to reduce use of materials (with embedded energy).	All	All	Pre-construction Construction	Pacific Complete/ Contractor	Reuse of materials maximised
SPIR-GH3	Greenhouse Gas Emissions	Steel with high recycled content will be specified where feasible where they are cost, quality and performance competitive. Contractors will be required to propose recycled content construction materials where they are cost, quality and performance competitive.	All	All	Pre-construction Construction	Pacific Complete/ Contractor	Where available from commercial steel suppliers within RMS specification and cost, quality and performance competitive; recycled steel will be sourced
SPIR-GH4	Greenhouse Gas Emissions	The feasibility of using biofuels (biodiesel, ethanol, or blends such as E10 or B80) will be investigated by the contractor, taking into consideration the capacity of plant and equipment to use these fuels, ongoing maintenance issues and local sources. Works will be planned to minimise fuel use.	All	All	Construction	Contractor	Assessed and not considered feasible for large scale infrastructure project
SPIR-GH5	Greenhouse Gas Emissions	An energy management plan will be developed during the construction of the project. The plan will include a commitment to monitor on-site energy consumption and identify and address on-site energy waste.	All	All	Pre-construction Construction	Contractor	Refer to approved Construction Waste and Energy Management Plan
SPIR-GH6	Greenhouse Gas Emissions	Roads and Maritime will investigate the use of LED lighting in place of incandescent lamps as part of the project's detailed design, and use them where practicable to reduce electrical energy consumption. Any energy-efficient alternatives will have to meet lighting standards for major roads.	All	All	Pre-construction	RMS/ Pacific Complete	For sections 1 & 2, RMS has investigated and has approved LED lighting. Contractors are required to progress utilisation of LED lighting as part of a design and construct component.
SPIR-GH7	Greenhouse Gas Emissions	An education program will be developed and delivered to the construction personnel to promote energy-efficient work practices.	All	All	Construction	Pacific Complete/ Contractor	Included in project induction
Hydrology & Flooding							
SPIR-HF1	Hydrology and Flooding	Flood models for the areas of the project that are in the Clarence, mid Richmond and lower Richmond rivers will be updated to inform detailed design.	4, 5, 6, 8, 9 and 10	Stage 2	Pre-construction Detailed Design	Pacific Complete	NA
SPIR-HF2	Hydrology and Flooding	Roads and Maritime will update the bathymetrical data at the relevant crossing of the Clarence River to inform detailed design of the crossing.	4, 5	Stage 2	Pre-construction Detailed Design	RMS	NA
SPIR-HF3	Hydrology and Flooding	Cane drain diversions will be designed and constructed in consultation with the relevant cane industry stakeholders and impacted landowners. This will consider the potential diversions detailed in the Working Paper – Hydrology and flooding and the additional assessment provided in Chapter 3 of the Submissions / Preferred Infrastructure Report.	All	All	Pre-construction Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	NA
SPIR-HF4	Hydrology and Flooding	Any permanent fencing at culvert and bridge crossings will consider the potential for blockage and be designed and operated to maintain the existing flood regime.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	This has been addressed during detailed design process

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-HF5	Hydrology and Flooding	Detailed design for permanent road fencing will consider hydrology and flooding impacts.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	This has been addressed during detailed design process
SPIR-HF6	Hydrology and Flooding	Scour and erosion protection measures at temporary and permanent waterway crossings will be provided upstream and downstream of the highway, particularly within 50 metres of Class 1 waterways or within the range of the Oxleyan Pygmy Perch as identified in section 3.9.6 of the Working paper – Biodiversity and the supplementary biodiversity assessment in Appendix J of the Submissions / Preferred Infrastructure Report. This will be undertaken in consultation with the Department of Primary Industries (Fisheries).	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	This has been addressed during detailed design process
SPIR-HF7	Hydrology and Flooding	Waterway diversions will be designed in consultation with Office of Environment and Heritage, NSW Office of Water and Department of Primary Industries (Fisheries) so that the final diversion mimics, where feasible and reasonable, the characteristics of the waterway that is being diverted. Characteristics include flow regime, flow velocity, base material, vegetation and habitat for aquatic fauna.	All	All	Detailed Design Construction	Pacific Complete/ Detailed Designer	This has been addressed during the detailed design and is captured within the contract documents
SPIR-HF8	Hydrology and Flooding	Revegetation of waterway diversions and surrounding areas will be undertaken in accordance with the following principles: • Diversions will be stabilised prior to the diversion receiving flows, in conjunction with the establishment of other scour and erosion control measures. • Diversions will establish appropriate vegetation communities along the channel bed and banks, using endemic native species.	All	All	Detailed Design Construction	Contractor	This has been addressed during the detailed design and is captured within the contract documents.
SPIR-HF9	Hydrology and Flooding	Velocities of flood flows through watercourse and floodplain structures (ie bridges and culverts) will be assessed during detailed design in areas identified as known and potential habitat for the Oxleyan Pygmy Perch and the Purple-spotted Gudgeon in consultation with Department of Primary Industries (Fisheries). The design of these structures will consider the predicted changes to velocities from the existing case due to the project.	3;11	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-HF10	Hydrology and Flooding	Batter stability will be assessed and sufficient room provided on both sides of the diversion to allow access for maintenance and to meet batter stability requirements.	3	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-HF11	Hydrology and Flooding	Farm dams located within or partially within the project boundary will be acquired as part of the acquisition process in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* .	All	All	Pre-construction	RMS	For sections 1 & 2, the design complies with this requirement ,and all acquisitions have been undertaken in accordance with the Land Acquisition (Just Terms Compensation) Act 1991.
SPIR-HF12	Hydrology and Flooding	Potential impacts to farm dams located downstream of the project that are fed by catchments upstream, and that have a diversion of rainfall as a result of the project, will be considered during the relevant property acquisition process.	All	All	Pre-construction	RMS	The design considers this impact. Consultation during land acquisition identifies these impacts and is compensated for reduced run-off is expected.
SPIR-HF13	Hydrology and Flooding	Detailed design will consider flood access and evacuation for affected landowners including changes in stock access routes.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	This has been addressed during the detailed design in consultation with affected landowners.
SPIR-HF14	Hydrology and Flooding	The level of flood immunity of Eggins Drive into Corindi will be built at a 100 year ARI as agreed with Coffs Harbour City Council.	1	Stage 1	Construction	RMS	This has been addressed during the detailed design in consultation with Coffs City Council and has achieved a 1 in 100 year flood immunity.
SPIR-HF15	Hydrology and Flooding	The potential impacts of ancillary facilities and haul roads on cane drains will be further investigated and addressed when ancillary facility locations are confirmed. The design of these ancillary facilities will be developed in consultation with relevant cane industry stakeholders, affected landowners, and in accordance with the following principles: • Maintain conveyance characteristics of existing cane drains. • Provide adequate capacity in temporary drainage to prevent blockages.	4, 5, 6, 8,9,10,11	Stage 2	Pre-construction Detailed Design Construction	Pacific Complete/ Detailed Designer	NA
SPIR-HF16	Hydrology and Flooding	A drainage structure with an equivalent capacity of the current Goodwood Street underpass will be installed for the duration of construction.	4	Stage 2	Detailed Design Construction	Pacific Complete/ Contractor	NA
SPIR-HF17	Hydrology and Flooding	Any temporary infrastructure associated with the construction of bridges in the Clarence River, Clarence North Arm, Richmond River, Tuckombil Canal and Emigrant Creek will be secured or removed from the river and floodplain during flood events so not to create a debris hazard or blockage during a flood event.	5, 8 and 10	Stage 2	Construction	Contractor	NA
SPIR-HF18	Hydrology and Flooding	Appropriate span lengths of bridges will be specified during detailed design that considers the susceptibility of individual watercourse crossings to debris blockage.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	This has been addressed during the detailed design
SPIR-HF19	Hydrology and Flooding	All work within 40 metres of a permanent watercourse, crossed by the project, will be undertaken in accordance with the NSW Office of Water 'Guidelines for Controlled Actions' and industry best practice including maintaining where feasible and reasonable the geomorphic integrity and natural hydrological flow regime.	All	All	Detailed Design Construction	Pacific Complete/ Contractor	Noted
SPIR-HF20	Hydrology and Flooding	The design of temporary fencing at culvert and bridge crossings will consider the potential for blockage and be designed and operated in a manner that does not result in impacts on flooding.	All	All	Detailed Design Construction	Pacific Complete/ Detailed Designer	Noted
SPIR-HF21	Hydrology and Flooding	The need for design modifications to address changes in flood behaviour as a result of climate change will be considered in accordance with Roads and Maritime' Climate Change Plan (Roads and Maritime, 2012).	All	All	Pre-construction Detailed Design Construction	Pacific Complete/ Detailed Designer	This has been addressed during the detailed design
SPIR-HF22	Hydrology and Flooding	Recommendations made in Table 8-8 of Working paper – Hydrology and flooding to minimise the flood impacts of ancillary facilities will be considered in the final location and layout of ancillary facilities.	All	All	Pre-construction Detailed Design	Pacific Complete/ Contractor	For Sections 1 & 2, Ancillary Facilities will be assessed against the B73 locational criteria and the A2 (d) document.
SPIR-HF23	Hydrology and Flooding	Design objectives (for road flood immunity and flood management will apply during the detailed design phase. Where these objectives are not met, Roads and Maritime will work to either: • Achieve compliance thorough modified embankment or drainage design. • Achieve an acceptable level of mitigation of impacts through alternative design measures (eg raised access tracks) in consultation with the affected land owner.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	This has been addressed during the detailed design process.
SPIR-HF24	Hydrology and Flooding	The design of drainage structures across Chatsworth Island will be further reviewed during detailed design to enable the most appropriate and cost-effective structures to be installed.	5	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-HF25	Hydrology and Flooding	Maintenance regime of drainage structures will be considered during detailed design.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	Inspection of drainage structures included in routine site inspections, especially post flooding events.
SPIR-HF26	Hydrology and Flooding	Additional culverts north of Chaffin Creek at the overflow channel around station 52.6, will be hydraulically modelled and confirmed during the detailed design to manage potential flood impacts, to meet the flood management objectives detailed in the EIS.	3	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-HF27	Hydrology and Flooding	Roads and Maritime, in consultation with Clarence Valley Council and the relevant landowner, will consider opportunities to improve the drainage system performance in the Shark Creek area, where feasible and reasonable, during the detailed design phase.	4	Stage 2	Pre-construction Detailed Design	RMS/ Detailed Designer	NA
SPIR-HF28	Hydrology and Flooding	The detailed design of the bridges over Shark Creek and Tyndale cane drain 1 and 2 (Crackers and Lee drain) will consider fauna connectivity in addition to the hydraulic function of these structures.	4	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-HF29	Hydrology and Flooding	Detailed design will investigate viable options to maintain the existing flood behaviour in James Creek.	5	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-HF30	Hydrology and Flooding	Consultation with affected landowners will be undertaken during detailed design and construction regarding flooding impacts on properties, residences and other structures.	All	All	Pre-construction Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	This has been addressed during the detailed design and will continue during the construction phase.
Non-Aboriginal Heritage							
SPIR-HH1	Non-Aboriginal Historical Heritage	If at any time during construction associated with the project, unidentified historical heritage materials, features and/or deposits are found, the Roads and Maritime Standard Management Procedure: Unexpected Archaeological Finds (20121) will be followed.	All	All	Construction	Pacific Complete/ Contractor	Noted
SPIR-HH2	Non-Aboriginal Historical Heritage	Contractors will be given awareness training on non-Aboriginal historical heritage prior to commencement of construction works to ensure understanding of potential heritage items and the procedure in the event of discovery of historical heritage materials, features or deposits, or the discovery of human remains.	All	All	Construction	Pacific Complete/ Contractor	All subcontractors who are inducted onto the project have received a non-Aboriginal heritage induction as part of the project induction.
SPIR-HH3	Non-Aboriginal Historical Heritage	The Heritage management plan will be developed in consultation with the Heritage Council of NSW.	All	All	Construction	Pacific Complete/ Contractor	The Cultural Heritage Management Plan was developed with all the required stakeholders and government agencies.

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-HH4	Non-Aboriginal Historical Heritage	Should the impact to any historic heritage item change during detailed design, further assessment of impacts on the items will be undertaken.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	This has been addressed during the detailed design
SPIR-HH5	Non-Aboriginal Historical Heritage	At project section 1, site 2: a temporary barrier fence will be erected between item 39 and the ancillary site. The fence will remain in place until the conclusion of the use of the ancillary site at which time it will be removed.	1	Stage 1	Construction	Pacific Complete/ Contractor	Temporary barrier fencing in place. Working will not exceed beyond the project boundary.
SPIR-HH6	Non-Aboriginal Historical Heritage	At project section 10, site 4: a temporary barrier fence will be erected to protect the drainage channel that is not directly impacted by the project (item 43). The fence will remain in place until the conclusion of the use of the ancillary site at which time it will be removed.	10	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-HH7	Non-Aboriginal Historical Heritage	Where local or state significant heritage items not previously identified are identified on an ancillary site and use of the site will impact on the heritage significance of the item, the site will not be used for ancillary facilities.	All	All	Pre-construction	Pacific Complete/ Contractor	Noted
SPIR-HH8	Non-Aboriginal Historical Heritage	Where local or state significant heritage items are identified on an ancillary site and use of the site will not impact on the heritage significance of the item, appropriate management measures (such as barrier fencing) will be put in place to clearly identify the heritage item and exclude use of the ancillary site within the heritage item's curtilage. Use of these ancillary facilities may commence: • When the appropriate protective measures have been implemented. • When the relevant records have been updated and/or completed.	All	All	Pre-construction	Pacific Complete/ Contractor	Noted
SPIR-HH9	Non-Aboriginal Historical Heritage	Any new ancillary facility and spoil placement locations not identified as part of this EIS will require a non-Aboriginal heritage assessment, with a database search and site walkover to identify any potential heritage items. If items are found, HH4, HH7-HH8 will be followed.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	Noted
SPIR-HH10	Non-Aboriginal Historical Heritage	A temporary barrier fence will be erected between the stockyards and the works area prior to road construction works commencing. The fence will remain in place until the conclusion of the works in the vicinity of the items at which time it will be removed. The batter slope will not be constructed within five metres of the stockyards.	1	Stage 1	Pre-construction Construction	Pacific Complete/ Contractor	Temporary barrier fencing in place. Working will not exceed beyond the project boundary.
SPIR-HH11	Non-Aboriginal Historical Heritage	Architectural noise treatment to the house will be investigated and provided where reasonable and feasible and in consultation with a qualified heritage consultant. Consideration will be given for the need to revise the SOHI for this item when the specific architectural noise treatment options are identified.	1	Stage 1	Pre-construction	Pacific Complete	Assessment would need to be undertaken following Operational Noise Review to assess whether noise treatment warranted and feasible before engaging heritage specialist to ascertain works required.
SPIR-HH12	Non-Aboriginal Historical Heritage	Salvage excavation (of the coach way station and early coach road) will be undertaken from the project boundary along the front of the complex buildings to the edge of the existing highway before construction starts in the vicinity of the heritage item. Excavations will be undertaken in accordance with Heritage Branch guidelines and under the supervision of an appropriately qualified and experienced historical archaeologist. An appropriate research design and methodology will be prepared to best realise the research potential of this area of the site.	2	Stage 1	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-HH13	Non-Aboriginal Historical Heritage	The batter slope for the motorway upgrade will not be constructed within eight metres of the bar/restaurant building.	2	Stage 1	Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	NA
SPIR-HH14	Non-Aboriginal Historical Heritage	A temporary fence will be erected between the bar/restaurant building and the motorway upgrade construction before work starts in the vicinity of the heritage item. The fence will remain in place until construction is completed, at which time it will be removed.	2	Stage 1	Pre-construction Construction	Pacific Complete/ Contractor	NA
SPIR-HH15	Non-Aboriginal Historical Heritage	A photographic condition survey will be undertaken of the current condition of the heritage items with any damage to the item from construction to be repaired once construction is complete.	2	Stage 1	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-HH16	Non-Aboriginal Historical Heritage	Architectural noise treatment to the house will be investigated and provided where reasonable and feasible and in consultation with a qualified heritage consultant. Consideration will be given for the need to revise the SOHI for this item when the specific architectural noise treatment options are identified.	2	Stage 1	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH17	Non-Aboriginal Historical Heritage	Archival photographic recording will be undertaken in accordance with the Heritage Branch guidelines How To Prepare Archival Records Of Heritage Items (NSW Heritage Office, 1998) prior to its removal.	2	Stage 1	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH18	Non-Aboriginal Historical Heritage	Prior to the start of construction, the location and condition of the mature bunya trees will be recorded by an arborist. In consultation with an arborist, protective fencing will be erected adjacent to the property boundary to control impacts on the trees.	3	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA
SPIR-HH19	Non-Aboriginal Historical Heritage	Architectural noise treatment to the house will be investigated and provided where reasonable and feasible and in consultation with a qualified heritage consultant. Consideration will be given for the need to revise the SOHI for this item when the specific architectural noise treatment options are identified.	3	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH20	Non-Aboriginal Historical Heritage	A photographic condition survey will be undertaken of the current condition of the heritage items with any damage to the item from construction to be repaired once construction is complete.	4	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH21	Non-Aboriginal Historical Heritage	Where appropriate, and before construction commences, any loose or unstable components of the heritage item will be secured to minimise vibration impacts and remain secured until the conclusion of construction, at which time the securing mechanism/s will be removed. Any methods to secure the heritage item will be reversible and not cause damage to the item.	4	Stage 2	Pre-construction Construction	RMS/ Pacific Complete	NA
SPIR-HH22	Non-Aboriginal Historical Heritage	The Petticoat Lane tram tracks section will have a protective covering placed over them, (eg a geo textile fabric and heavy duty metal sheeting or similar) to minimise impacts from construction in the area. The covering will be secured before construction and will remain in place until the end of construction.	5	Stage 2	Pre-construction Construction	Pacific Complete/ Contractor	NA
SPIR-HH23	Non-Aboriginal Historical Heritage	The design of the new bridge will be undertaken in accordance with Bridge Aesthetics: Design Guidelines to Improve the Appearance of Bridges in NSW Roads and Maritime 2012 with specific reference to section 6.1, New bridges next to existing bridges.	5	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-HH24	Non-Aboriginal Historical Heritage	An archival photographic recording will be made of the convent building and its surrounds in accordance with the Heritage Branch guidelines How to Prepare Archival Records of Heritage Items (NSW Heritage Office, 1998) prior to its removal or relocation.	5	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH25	Non-Aboriginal Historical Heritage	The feasibility of relocating the building to an appropriate site within the Harwood Heritage Conservation Area will be investigated. The investigation will be undertaken in consultation with an appropriately qualified house removal contractor and an appropriately qualified heritage consultant.	5	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH26	Non-Aboriginal Historical Heritage	Architectural noise treatment to the house will be investigated and provided where reasonable and feasible and in consultation with a qualified heritage consultant. Consideration will be given for the need to revise the SOHI for this item when the specific architectural noise treatment options are identified.	5	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH27	Non-Aboriginal Historical Heritage	A photographic condition survey will be undertaken of the current condition of the heritage items with any damage to the item from construction to be repaired once construction is complete.	7	Stage 2	Pre-construction Construction	RMS/ Pacific Complete/ Contractor	NA

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-HH28	Non-Aboriginal Historical Heritage	Monitoring of dust will be undertaken at this location in accordance with the project dust management plan.	7	Stage 2	Pre-construction Construction	Pacific Complete	NA
SPIR-HH29	Non-Aboriginal Historical Heritage	A temporary fence will be erected between the State Heritage Register boundary and the construction works before work starts in the vicinity of the heritage item. The fence will remain in place until construction is completed at which time it be removed.	7	Stage 2	Operation	Pacific Complete/ Contractor	NA
SPIR-HH30	Non-Aboriginal Historical Heritage	Appropriate directional signage to the New Italy Museum Complex will be installed at both the interchange at Woodburn and interchange at Iluka Road to divert visitors onto the service road in order to access the museum complex. Signage will comply with relevant Pacific Highway signage policy.	7	Stage 2	Operation	Pacific Complete/ Contractor	NA
SPIR-HH31	Non-Aboriginal Historical Heritage	Monitoring of dust will be undertaken at this location in accordance with the project dust management plan.	7	Stage 2	Pre-construction Construction	Pacific Complete	NA
SPIR-HH32	Non-Aboriginal Historical Heritage	A temporary fence will be erected between the location of the memorial and flagpole and the construction works (within five metres of the heritage items) before work starts in the vicinity of the heritage item. The fence will remain in place until conclusion is completed at which time it will be removed.	7	Stage 2	Pre-construction Construction	Pacific Complete/ Contractor	NA
SPIR-HH33	Non-Aboriginal Historical Heritage	Salvage excavation will be undertaken to salvage any subsurface artefacts related to the well and adjacent wall. Excavations will be undertaken under the supervision of an appropriately qualified and experienced historical archaeologist and in accordance with the Heritage Branch guidelines, including an appropriate research design and methodology to best realise the research potential of this area of the site. Consideration will be given to providing salvaged artefacts to the New Italy Museum.	7	Stage 2	Pre-construction Construction	RMS/ Pacific Complete	NA
SPIR-HH34	Non-Aboriginal Historical Heritage	Before construction starts in the vicinity of the orchard, the location and condition of each of the mango trees will be recorded by an arborist.	7	Stage 2	Pre-construction Construction	RMS/ Pacific Complete	NA
SPIR-HH35	Non-Aboriginal Historical Heritage	Protective barrier fencing to protect the mango orchard will be erected between the construction area and the trees with a buffer of at least five metres. This will be erected before construction starts in the vicinity of the items and remain in place until the end of construction at which time it will be removed.	7	Stage 2	Pre-construction Construction	Pacific Complete/ Contractor	NA
SPIR-HH36	Non-Aboriginal Historical Heritage	An archival photographic recording will be made of the mango orchard and its surrounds in accordance with the Heritage Branch guidelines How To Prepare Archival Records Of Heritage Items (NSW Heritage Office, 1998) prior to its demolition.	7	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH37	Non-Aboriginal Historical Heritage	If any historical heritage remains are discovered at the New Italy Village Area during construction, management measure HH1 will be applied.	7	Stage 2	Pre-construction Construction	Pacific Complete/ Contractor	NA
SPIR-HH38	Non-Aboriginal Historical Heritage	An archival photographic recording will be made of the buttery/creamery, the dairy and its surrounds in accordance with the Heritage Branch guidelines How To Prepare Archival Records Of Heritage Items (NSW Heritage Office, 1998) prior to demolition.	9	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH39	Non-Aboriginal Historical Heritage	Architectural noise treatment to the house will be investigated and provided where reasonable and feasible and in consultation with a qualified heritage consultant. Consideration will be given for the need to revise the SOHI for this item when the specific architectural noise treatment options are identified.	9	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH40	Non-Aboriginal Historical Heritage	Further investigations for gold shafts within and adjacent to the project corridor will occur near item 26.	9	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH41	Non-Aboriginal Historical Heritage	If brick material or any other historical heritage remains are discovered during works, management measure HH1 will be applied.	10	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-HH42	Non-Aboriginal Historical Heritage	An archival photographic recording will be made of the stone quarry and small clay pit in accordance with the Heritage Branch guidelines How To Prepare Archival Records Of Heritage Items (NSW Heritage Office, 1998) prior to construction.	9	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH43	Non-Aboriginal Historical Heritage	Salvage excavations to the south of the quarry will be undertaken under the supervision of an appropriately qualified and experienced historical archaeologist. Salvage excavation will be undertaken in accordance with the Heritage Branch guidelines including an appropriate research design and methodology to best realise the research potential of this area of the site.	9	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH44	Non-Aboriginal Historical Heritage	A photographic condition survey and structural audit of the brick-lined well will be undertaken of the current condition of the heritage item with any damage to the item from construction to be repaired once construction is complete.	9	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH45	Non-Aboriginal Historical Heritage	Should blasting be required in the vicinity of this item, a detailed assessment of the level of vibration at the brick-lined well will be undertaken based on factors including distance from the blast site and the quantity of the explosive, and modelling of the predicted vibration levels. This assessment may result in additional mitigation measures for the structure including, but not limited to: • Construction of temporary or permanent supports or shoring within the brick-lined well. • Stabilisation of the brick-lined well. • Installation of vibration monitoring devices.	9	Stage 2	Pre-construction Construction	Pacific Complete/ Contractor	NA
SPIR-HH46	Non-Aboriginal Historical Heritage	Protective barrier fencing will be erected around the brick-lined well with a 15-metre buffer before the start of construction and will remain in place until the conclusion of the work, at which time it will be removed.	9	Stage 2	Pre-construction Construction	Pacific Complete/ Contractor	NA
SPIR-HH47	Non-Aboriginal Historical Heritage	Due to the proximity of the well to the roadway, the well may be closed for safety reasons. Any measures to close the well will enable access in the future for heritage research or other purposes and that no detrimental physical impact on the well occurs.	9	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-HH48	Non-Aboriginal Historical Heritage	An archival photographic recording will be made of the main residence and the drainage system and its surrounds in accordance with the Heritage Branch guidelines How To Prepare Archival Records Of Heritage Items (NSW Heritage Office, 1998) prior to its demolition. A detailed survey and recording of the location of the drainage system within the 'Stonehenge' property will also be undertaken.	10	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH49	Non-Aboriginal Historical Heritage	Architectural noise treatment to the house will be investigated and provided where reasonable and feasible and in consultation with a qualified heritage consultant. Consideration will be given for the need to revise the SOHI for this item when the specific architectural noise treatment options are identified.	10	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
SPIR-HH50	Non-Aboriginal Historical Heritage	To protect the heritage item from construction activities, the boundary of the reserve will be clearly identified on site/construction plans as an area of exclusion, and temporary barrier fencing will be constructed continuously along the project boundary: • Immediately south of the cemetery reserve. • Where it crosses the south east corner of the cemetery reserve. • Where it follows the east boundary of the cemetery reserve.	9	Stage 2	Pre-construction Construction	Pacific Complete/ Contractor	NA
SPIR-HH51	Non-Aboriginal Historical Heritage	Detailed design will consider the extent to which clearing High Conservation Value Old Growth Forest within the project boundary may be minimised.	2, 6 and 7	Stage 1 & 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-HH52	Non-Aboriginal Historical Heritage	The area to be cleared will be clearly identified on-site. High Conservation Value Old Growth Forest adjacent to areas to be cleared will be delineated to avoid accidental disturbance on further areas.	2, 6 and 7	Stage 1 & 2	Construction	Contractor	NA
SPIR-HH53	Non-Aboriginal Historical Heritage	An archival photographic recording be made of the drainage channels and its surrounds in accordance with the Heritage Branch guidelines prior to its destruction.	10	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
Land Use							
SPIR-LU1	Property & Landuse	Ongoing communication and consultation will be undertaken with directly affected property owners about the property acquisition process. This includes the provision of information on the timing of acquisitions, and the process for property acquisitions under the *Land Acquisition (Just Terms Compensation) Act 1991* and Roads and Maritime' Land Acquisition Policy (RTA, 1999).	All	All	Pre-construction	RMS	Noted and is ongoing in accordance with the Land Acquisition (Just Terms Compensation) Act 1991 and RMS' Land Acquisition Policy (RTA, 1999).
SPIR-LU2	Property & Landuse	Ongoing consultation will be undertaken with directly affected property owners during the detailed design phase to identify measures to mitigate potential impacts on the use and viability of land. This will relate to matters such as adjustments to fencing, access, farm infrastructure and relocation of impacted ancillary structures, as required.	All	All	Pre-construction Detailed Design	RMS/ Pacific Complete/ Detailed Designer	Noted and is ongoing in accordance with the Land Acquisition (Just Terms Compensation) Act 1991 and RMS' Land Acquisition Policy (RTA, 1999).
SPIR-LU3	Property & Landuse	Property adjustments will be completed for fencing, access tracks, cattle underpasses and other farm infrastructure in consultation with the impacted land owner.	All	All	Pre-construction Detailed Design	RMS/ Pacific Complete/ Detailed Designer	Standard process - ongoing
SPIR-LU4	Property & Landuse	The Fencing Strategy will be further developed during detailed design, in consultation with relevant stakeholders. This will build upon the principles of the strategy described in Chapter 3 of the Submissions and Preferred Infrastructure Report (Roads and Maritime, 2013).	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	The fencing strategy was further developed as part of detailed design for Sections 1 and 2. This involved all relevant stakeholders to maximise the potential of achieving appropriate fencing outcomes in all locations.
SPIR-LU5	Property & Land use	Sterilisation and severance of land uses and lots will be minimised by amalgamating severed parcels of land together, where possible, with provision of road access, in accordance with the project's remnant land use strategy.	All	All	Pre-construction Detailed Design	RMS/ Pacific Complete/ Detailed Designer	This has been considered where ever possible, and will be finalised post construction
SPIR-LU6	Property & Land use	Where required, acquisition of State forests will be minimised in accordance with the provisions of the *Forestry Act* 2012. Revocation of land dedicated or reserved as national parks or nature reserves will be in accordance with the *National Parks and Wildlife Act 1974* . Acquisition of land owned by Local Aboriginal Land Councils will be in accordance with the provisions of the *Aboriginal Land Rights Act 1983* .	All	All	Pre-construction Detailed Design	RMS/ Pacific Complete/ Detailed Designer	Land acquired from State Forest and Aboriginal Land Councils has been/currently undertaken by RMS Property Section in accordance with relevant legislation.
SPIR-LU7	Property & Landuse	A remnant land strategy to minimise land use severance and sterilisation, and a mitigation strategy for final land uses will be developed in consultation with cane industry stakeholders, Coffs Harbour City, Clarence Valley, Richmond Valley and Ballina Councils.	All	All	Pre-construction Detailed Design	RMS/ Pacific Complete/ Detailed Designer	This requirement has been considered where ever possible, and will be finalised both during and post construction in consultation with relevant industry and Councils
SPIR-LU8	Property & Landuse	The requirement for a retaining wall structure at station 83.2, between the road reserve and adjoining property, will be confirmed during detailed design.	5	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-LU9	Property & Landuse	Access to properties near construction works will be maintained, including where required for the movement of farm equipment and livestock between properties, unless otherwise agreed with landowners.	All	All	Construction	Pacific Complete/Contractor	Access maintained - ongoing.
SPIR-LU10	Property & Landuse	Where temporary changes to property access are required during construction, alternative access will be determined in consultation with affected property owners and tenants.	All	All	Construction	Pacific Complete/Contractor	Access maintained - ongoing.
SPIR-LU11	Property & Landuse	There will be ongoing communication with local communities about changes to the local road network, including likely delays and disruptions and alternative accesses if required.	All	All	Construction	Pacific Complete/Contractor	Achieved via notifications reviewed and approved by RMS
SPIR-LU12	Property & Landuse	Where possible, onsite reuse of any spoil is the preferred solution for managing the impacts, although alternative options for the reuse or disposal of spoil will be identified in the surplus material management plan.	All	All	Construction	Contractor	Included in approved CSWMP
SPIR-LU13	Property & Landuse	The management of surplus material will be further developed during detailed design, in consultation with relevant stakeholders. This will build upon the principles of the strategy described in Chapter 3 of the Submissions and Preferred Infrastructure Report (Roads and Maritime, 2013).	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	Noted
SPIR-LU14	Property & Landuse	Forestry Corporation of NSW will be able to harvest millable timber in affected State forests prior to works commencing. However, consideration will also be given to opportunities for the productive use of trees removed from non-State forest areas of the project, including ancillary facilities where necessary.	All	All	Construction	Pacific Complete	Harvest of millable timber maximised during clearing operations
SPIR-LU15	Property & Landuse	Environmental management measures will be implemented to minimise potential for impacts on adjoining agricultural uses, including from changes in water quality and spread of weeds and pests.	All	All	Construction	Pacific Complete/ Contractor	Refer to CSWMP and CFFMP
SPIR-LU16	Property & Landuse	Where pesticides are required during construction, implement appropriate environmental management measures to avoid potential impacts on adjoining agricultural properties.	All	All	Construction	Contractor	Included in approved CFFMP
SPIR-LU17	Property & Landuse	There will be ongoing consultation and communication with managers of agricultural properties to identify any potential impacts on nearby construction workers from farm operations (ie use of pesticides on agricultural properties).	All	All	Construction	Pacific Complete/ Contractor	Noted
SPIR-LU18	Property & Landuse	Ongoing consultation and communication will be undertaken with commercial fishing and relevant aquaculture operators about construction activities within and near the Clarence and Richmond rivers. Stakeholders include the estuary prawn trawl fishery, and estuary general fishery within the Clarence River, the NSW Department of Primary Industries (Fisheries) and licensed fishing interests within the Richmond River regarding the timing and duration of construction, potential impacts (including changes to river access) and proposed mitigation measures.	Stage 2	Stage 2	Construction	Contractor	NA
SPIR-LU19	Property & Landuse	Relocation or adjustment of infrastructure will be planned to minimise disruptions and impacts on surrounding properties.	All	All	Construction	Pacific Complete/ Contractor	Noted and is being undertaken during both preconstruction and construction
SPIR-LU20	Property & Landuse	Communication will be undertaken with nearby communities about the timing and duration of potential disruptions to infrastructure.	All	All	Construction	Pacific Complete/ Contractor	Noted and is being undertaken in accordance with the RMS Communications Strategy and the Contractors Community Action Plan
SPIR-LU21	Property & Landuse	Roads and Maritime' land that is required for the project will be appropriately maintained. This will be undertaken by regional Roads and Maritime officers or a designated local authority. Roads and Maritime manage the leasing and maintenance of property identified as suitable for tenants.	All	All	Operation	RMS	This is being undertaken in accordance with RMS Property maintenance processes.
SPIR-LU22	Property & Landuse	Excavation works near Lot7008 DP92609 will be carefully managed in consultation with Richmond Valley Council to minimise potential impacts on any unknown heritage items including potential burials.	9	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-LU23	Property & Landuse	Ongoing consultation will be undertaken with owners of agricultural properties affected by the project – through acquisition, changes to local access or fragmentation of properties – about potential impacts on farming operations and potential measures to manage or mitigate identified impacts.	All	All	Operation	Pacific Complete/ Contractor	Noted and is ongoing in accordance with the Land Acquisition (Just Terms Compensation) Act 1991 and RMS' Land Acquisition Policy (RTA, 1999).
SPIR-LU24	Property & Landuse	Consultation with Forestry Corporation will be undertaken regarding access to and within State forests where required, in accordance with the *Forestry Act* 2012.	All	All	Detailed Design Operation	Pacific Complete/ Contractor	This has been completed for Sections 1 & 2, and will be ongoing during construction for the contractor. Section 2 has 4.5Ha of State Forest under Forest Permit Lease (issued by Forestry Corporation of NSW) for construction and operation of temporary sedimentation basins and stockpiles.
SPIR-LU25	Property & Landuse	Consultation with Forestry Corporation will be undertaken regarding the relocation of fire trails directly impacted by the project's construction or operation.	All	All	Detailed Design Operation	Pacific Complete/ Contractor	This has been completed for Sections 1 & 2, and will be ongoing during construction for the contractor. Notification requirements are listed in the G36 and G40.
SPIR-LU26	Property & Landuse	The Cane Farm Strategy will be further developed during detailed design, in consultation with relevant stakeholders. This will build upon the principles of the strategy described in Chapter 3 of this Submissions and Preferred Infrastructure Report.	All	All	Pre-construction Detailed Design	Pacific Complete	Consultation held with relevant stakeholders to capture design requirements. Property acquisition plans include drainage.
SPIR-LU27	Property & Landuse	As far as possible, property accesses will be reinstated or new access provided, in consultation with impacted landowners.	All	All	Detailed Design Operation	Pacific Complete/ Detailed Designer/ Contractor	For sections 1 & 2, new property accesses have been designed to replace those that are lost or modified. This has been undertaken in consultation with impacted landowners.

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-LU28	Property & Landuse	Access to national parks and nature reserves will be reinstated in consultation with the relevant department in Office of Environment and Heritage.	All	All	Detailed Design Operation	Pacific Complete/ Detailed Designer/ Contractor	Noted
SPIR-LU29	Property & Landuse	Consultation will be undertaken with land owners operating quarries adjacent to the project, including those near Tucabia, Broadwater and Bagotville, and relevant NSW State government agency. Consultation aim to identify appropriate management measures for each affected quarry, particularly regarding operational approvals in terms of site access, extraction limits, blasting limits, and timing of works, noise and vibration.	3, 9 and 10	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer/ Contractor	NA
SPIR-LU30	Property & Landuse	Consultation will be undertaken with the relevant State Government agency to consider any future coal seam gas production in the vicinity of the project.	All	All	Pre-construction	RMS/ Pacific Complete	Noted
SPIR-LU31	Property & Landuse	Consultation will be undertaken with service and utility providers to verify locations, impacts and any relocation or construction protection work required.	All	All	Detailed Design Operation	Pacific Complete/ Detailed Designer/ Contractor	This has been Completed for Sections 1 & 2
SPIR-LU32	Property & Landuse	Consultation will be undertaken with Rous Water and local Aboriginal stakeholders before the removal of part or any of the abandoned pipelines through Lang Hill will be undertaken in consultation	8	Stage 2	Pre-construction	Pacific Complete/ Contractor	NA
SPIR-LU33	Property & Landuse	Consultation will be undertaken with Richmond Valley Council during the detailed design phase, regarding the location and timing of the Broadwater Sewerage Scheme rising pump station, located off Broadwater-Evans Head Road.	9	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
Social & Economic							
SPIR-SE1	Social and Economic	Consultation will be undertaken with local business owners, industry and tourism operators directly affected by construction and located closest to construction works. The focus will be on the timing, duration and likely impact of construction activities, to identify appropriate measures to manage potential impacts.	All	All	Pre-construction Construction	Pacific Complete/ Contractor	Ongoing consultation with Matilda and Shell service stations being implemented by Community Relations team throughout construction
SPIR-SE2	Social and Economic	Consultation will be undertaken with managers of community services and facilities near the proposed construction works, to ensure that potential impacts are appropriately managed.	All	All	Pre-construction Construction	Pacific Complete/ Contractor	Ongoing consultation with Halfway Creek Community Hall being implemented by Community Relations team throughout construction
SPIR-SE3	Social and Economic	Consultation will be undertaken with residents and local communities closest to construction works about construction activities, including timing, duration and likely impacts.	All	All	Pre-construction Construction	Pacific Complete/ Contractor	Noted and is being undertaken in accordance with RMS communications strategy and the contractors community action plan
SPIR-SE4	Social and Economic	Signage will be implemented for bypassed towns in accordance with Roads and Maritime signage guidelines and in consultation with relevant councils. Signage on the project will identify bypassed townships (Grafton, Ulmarra, Tyndale, Maclean, New Italy, Woodburn, Broadwater and Wardell) as places for 'stopovers' for fuel, supplies and short term accommodation, to support demand for goods and services within these townships.	Stage 2	Stage 2	Detailed Design Construction Operation	Pacific Complete/ Detailed Design/ RMS	Stage 2
SPIR-SE5	Social and Economic	Roads and Maritime will work with Councils affected by the upgrade, where relevant, to support strategies by local councils and/or chamber of commerce and industry to promote townships and villages as stopovers for tourist.	All	All	Construction Operation	RMS/ Pacific Complete	Noted and is being undertaken in accordance with RMS communications strategy and the contractors community action plan
SPIR-SE6	Social and Economic	Roads and Maritime will work with Councils affected by the upgrade, during detailed design, to discuss the classification of the existing Pacific Highway and, where appropriate, the required transfer process of state road assets to Council.	All	All	Pre-construction Detailed Design	RMS/ Pacific Complete/ Detailed Designer	Noted Council are invited to the ERG
SPIR-SE7	Social and Economic	Maintain access to properties near to the project during construction, including, where required, for the movement of farm equipment and livestock between properties, and for access to the Berry Exchange and other affected agribusinesses.	All	All	Construction	Contractor	Undertaken by Community Relations Team
SPIR-SE8	Social and Economic	Where temporary changes to property access are required during construction, alternative access will be determined in consultation with affected property owners and tenants.	All	All	Construction	Pacific Complete/ Contractor	Undertaken by Community Relations Team where required
SPIR-SE9	Social and Economic	Undertake consultation with the Harwood Island Public School and other community facilities located adjacent to the project about proposed changes to local access.	All	All	Operation	RMS	NA
SPIR-SE10	Social and Economic	Undertake early and ongoing communication and consultation with emergency services to allow planning for potential changes to response patterns and input into the design development.	All	All	Detailed Design Operation	Pacific Complete/ Detailed Designer	For sections 1 and 2, this has been undertaken during preconstruction.
SPIR-SE11	Social and Economic	Access to Broadwater mill land between MacDonalds Street and River Road will be reviewed at the detailed design stage.	9	Stage 2	Detailed Design Operation	Pacific Complete/ Detailed Designer	NA
SPIR-SE12	Social and Economic	The access arrangements for local traffic at Whytes Lane and the tie into the Ballina bypass upgrade will be reviewed together with any potential boundary refinements at the detailed design stage.	11	Stage 2	Detailed Design Operation	Pacific Complete/ Detailed Designer	NA
Soil & Water							
SPIR-SSW1	Soil & water	Batter slope gradients will be designed to minimise erosion of select topsoil.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	For sections 1 & 2, this has been addressed during detailed design.
SPIR-SSW2	Soil & water	Where feasible, bench cuttings will be diverted onto contours and surface flow drainage paths designed to spread flow at the source in preference to concentrating the flow and treating it further downstream.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	For sections 1 & 2, this has been addressed during detailed design.
SPIR-SSW3	Soil & water	As part of the Construction Environmental Management Plan, a soils and water management plan will be prepared and include (but not limited to): • Erosion and sediment control plans for all stages of construction. • Consideration of soil erodibility. • At-source erosion controls (eg check dams). • Sedimentation basin construction and management. • Protection of waterways. • Acid sulfate soil sub-plan issues (including from groundwater drawdown). • Management of stockpiles. • Tannin leachate management control. • Batch plant/ chemical storage controls. • Water quality monitoring and checklists. • Detailed consideration of measures to prevent, where possible, or minimise any water quality impacts.	All	All	Pre-construction	Pacific Complete/ Contractor	Approved CEMP include Construction Soil and Water Management Plan
SPIR-SSW4	Soil & water	Erosion and sediment control plans will be developed in line with current Roads and Maritime specifications and as detailed in the Working paper – Water quality.	All	All	Pre-construction Detailed Design	Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-SSW5	Soil & water	A soil conservationist will be engaged during detailed design to inform the soils and water management plan.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	Completed
SPIR-SSW6	Soil & water	Sedimentation basins and water quality ponds will be sized and located in accordance with the principles identified in the Working paper – Water quality.	All	All	Pre-construction Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	Completed
SPIR-SSW7	Soil & water	Exposed areas will be progressively rehabilitated. Methods will include permanent revegetation, or temporary protection with spray mulching or cover crops.	All	All	Construction	Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-SSW8	Soil & water	Any necessary approvals will be obtained in accordance with Roads and Maritime specification G36 for permanent and temporary waterway crossings.	All	All	Construction	Pacific Complete/ Contractor	Significant consultation has occurred during preconstruction with several agencies regarding the permanent design and will be ongoing for temporary waterway crossings, including Fisheries and EPA.
SPIR-SSW9	Soil & water	All work potentially affecting wetlands will be undertaken in consideration of the requirements outlined in the NSW Wetlands Management Policy 2010.	All	All	Detailed Design Construction	Pacific Complete/ Contractor	Noted
SPIR-SSW10	Soil & water	Topsoil, earthworks and other excess spoil material will be stockpiled and managed in accordance with Roads and Maritime Stockpile Management Guidelines (Roads and Maritime, 2011a) and the "Management of Surplus Material" in Section 3.9 of the Submissions / Preferred Infrastructure Report.	All	All	Construction	Pacific Complete/ Contractor	Included as part of approved Construction Soil and Water Management Plan

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-SSW11	Soil & water	Where reasonable and feasible, stockpiles will: • Not require removal of areas of native vegetation. • Be located outside of known areas of weed infestation. • Be located such that waterways and drainage lines are not directly or indirectly impacted.	All	All	Construction	Pacific Complete/ Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-SSW12	Soil & water	Where practicable, stockpiles will be located away from areas subject to concentrated overland flow. Stockpiles located on a floodplain be finished and contoured so as to minimise loss of material in flood or rainfall events.	All	All	Construction	Pacific Complete/ Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-SSW13	Soil & water	Topsoil will be stockpiled separately and inspected for noxious weed seedlings at six monthly intervals and controlled with herbicide as required.	All	All	Construction	Pacific Complete/ Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-SSW14	Soil & water	All construction stockpiles will comply with the requirements of the *Protection of the Environment Operations Act 1997* and NSW Waste Avoidance and Resource Recovery Strategy 2007 for any waste activities that involve the generation, storage and/or disposal of waste and also consider the NSW Resource Recovery Exemptions as applying the storage of stockpiled material.	All	All	Construction	Pacific Complete/ Contractor	Noted
SPIR-SSW15	Soil & water	Stockpiles containing potential acid sulfate soils will be lined, bunded and covered in accordance with relevant guidelines.	All	All	Construction	Pacific Complete/ Contractor	Included as part of approved Construction Acid Sulphate Materials Management Plan
SPIR-SSW16	Soil & water	Management of tannin leaching from vegetation mulch will be in accordance with Roads and Maritime' Environmental Direction – Management of Tannins from Vegetation Mulch (Roads and Maritime, 2012).	All	All	Construction	Pacific Complete/ Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-SSW17	Soil & water	A Stage 1 Preliminary Site Investigation will be conducted to verify past and present potentially contaminating activities, potential contaminants of concern and the need for further investigation. This will include a review of past highway crashes and spills and the associated contamination risks.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	Completed
SPIR-SSW18	Soil & water	If necessary, a Stage 2 Detailed Site Investigation will be undertaken to: • Provide information on the type, nature, extent and concentrations of contamination present, and the corresponding risks to human health and the environment. • Examine pathways of contaminant dispersal and exposure, the potential for off-site impacts and the management requirements and options.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	For sections 1 and 2, a Phase 2 contamination investigation has been undertaken. For other sections and based on outcome of the Stage 1 Investigations, this has not been required.
SPIR-SSW19	Soil & water	If required, a Stage 3 Remedial Action Plan will be produced, detailing the remediation goals, environmental safeguards, and any necessary approval and licence requirements in accordance with NSW Office of Environment and Heritage guidelines.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	Based on outcome of the Stage 1 Investigations, this has not been required.
SPIR-SSW20	Soil & water	Where further assessment indicates that further action is not required, Roads and Maritime' Contaminated Land Management Guideline (RTA, 2005a) will be applied to address any contamination issues and prevent any associated adverse impacts.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	Noted
SPIR-SSW21	Soil & water	A hazardous materials buildings assessment will be carried out before the demolition of any structures or buildings to identify the issues of concern and the management requirements. This is required under Clause 1.6 of Australian Standard AS 2601 – 2001 The Demolition of Structures.	All	All	Construction	Pacific Complete/ Contractor	Undertaken by a licensed demolition sub-contractor
SPIR-SSW22	Soil & water	An emergency spill response plan will be developed and incorporated into the soils and water management plan. This plan will detail measures for the prevention, containment and clean-up of accidental spills of fuels and chemicals.	All	All	Construction	Pacific Complete/ Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-SSW23	Soil & water	The storage, handling and use of the chemicals and fuels will be in accordance with the Work Health and Safety Act 2000 and Workcover's Storage and Handling of Dangerous Goods Code of Practice (WorkCover, 2005).	All	All	Construction	Pacific Complete/ Contractor	Noted
SPIR-SSW24	Soil & water	Strategies to remove / reduce risks associated with acid sulfate soils will be identified.	All	All	Pre-construction Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	Noted and this has been undertaken during preconstruction and will continue to be applied during the construction phase.
SPIR-SSW25	Soil & water	An acid sulfate soils management plan will be implemented in accordance with Guidelines for the Management of Acid Sulfate Materials (Roads and Maritime 2005) and Waste Classification Guidelines Part 4: Acid Sulfate Soils (DECC 2008), where there is a probability of encountering acid sulfate soils during construction.	All	All	Construction	Pacific Complete/ Contractor	Noted. (S1 does not have an ASSMP)
SPIR-SSW26	Soil & water	Appropriate erosion and sediment controls, following the guidelines of the 'Blue Books' (Landcom, 2004 and DECC, 2008a), and Roads and Maritime' Technical Guideline – Temporary Stormwater Drainage for Main Road Construction (Roads and Maritime, 2010b) will be established before the start of construction and maintained in effective working order for the duration of the construction period until site stabilisation.	All	All	Construction	Pacific Complete/ Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-SSW27	Soil & water	Works within waterways will consider the need to maintain fish passage, in consultation with the Department of Primary Industries (Fisheries).	All	All	Detailed Design Construction	Pacific Complete/ Contractor	There has been significant consultation with DPI and has been ongoing during construction.
SPIR-SSW28	Soil & water	Flow discharge points will be designed with erosion controls to manage the flow velocities.	All	All	Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	Noted and addressed during detailed design
SPIR-SSW29	Soil & water	Where appropriate, construction phase sedimentations basins will be designed so they could be retained and used as permanent operational water quality ponds, where required for operational purposes.	All	All	Detailed Design Construction	Pacific Complete/ Detailed Designer	Noted and addressed during detailed design
SPIR-SSW30	Soil & water	Sizing of sedimentation basins that drain into the Solitary Islands Marine Park will be reviewed to consider the use of 90th percentile sedimentation basins.	1	Stage 1	Detailed Design Construction	Pacific Complete/ Detailed Designer	90th percentile basins have been included from chainage 8200 to the southern portion of Section 1 which is considered a part of the upstream catchment to the Solitary Islands Marine Park.
SPIR-SSW31	Soil & water	Sedimentation basins will be inspected at regular intervals and following significant rainfall events to assess available water storage capacity, water quality, structural integrity and debris levels.	All	All	Construction	Pacific Complete/ Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-SSW32	Soil & water	Where appropriate, an approved flocculent will be applied to sedimentation basins as early as possible so that early mixing of flocculants occurs. Water quality will be tested prior to discharge in accordance with any licence requirements.	All	All	Construction	Pacific Complete/ Contractor	Included as part of approved Construction Soil and Water Management Plan, gypsum & calcium chloride are currently an accepted flocculent & used on the project.
SPIR-SSW33	Soil & water	Where sediment has built up in a basin to a point where the total sediment storage zone has reached capacity, sediment will be removed and appropriately disposed of.	All	All	Construction	Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-SSW34	Soil & water	Water from sedimentation basins will be used for construction purposes, such as dust suppression, where feasible.	All	All	Construction	Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-SSW35	Soil & water	When sedimentation basins require pumping out rather than discharge via a flow outlet, a float will be attached to the suction hose or the hose will be located inside a bucket to prevent sediment from the basin floor from being discharged.	All	All	Construction	Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-SSW36	Soil & water	Records will be kept of water quality monitoring and erosion and sediment control inspections, including details of rain events, use of flocculants, discharge, sediment removal and dewatering activities.	All	All	Construction	Pacific Complete/ Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-SSW37	Soil & water	Physical controls to address the potential risks associated with the use and storage of chemicals on site will include: • Use of appropriately bunded storage facilities for chemicals and fuels. • Use of appropriately bunded areas for refuelling and washdown. • Availability of effective spill kits at all construction sites.	All	All	Construction	Pacific Complete/ Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-SSW38	Soil & water	At ancillary facilities, management of runoff and spills will include: • Restricting vehicle movements to designated pathways where feasible. • Paving areas that will be exposed for extended periods, such as car parks and main access roads, where reasonable and feasible. • Diverting off-site runoff around sites where required. • Locating chemical or other hazardous material storage areas away from areas of known near-surface groundwater supplies, in areas where the water table is more than five metres below the surface; otherwise, areas be lined if they are to be located over a shallow groundwater source less than two metres deep.	All	All	Construction	Pacific Complete/ Contractor	Included in approved ancillary facility management sub plans
SPIR-SSW39	Soil & water	Soil and water management at borrow source sites will be in line with Volume 2E of the Blue Book which covers water management of mines and quarries.	All	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-SSW40	Soil & water	Discharges from the sediment basins during construction that do not meet the water quality parameters for Oxleyan Pygmy Perch habitat should not be discharged into the waterways that are known habitat for Oxleyan Pygmy Perch. Strategies will be implemented during construction to manage discharge of basin water, so that water depth and physico-chemical conditions are not changed in areas of Oxleyan Pygmy Perch habitat. Discharge protocols and criteria will be developed in consultation with Department of Primary Industries (Fisheries) and Office of Environment and Heritage during detailed design.	1, 2, 6, 7, 8 and 9	All	Construction	Pacific Complete/ Contractor	Not applicable for Section 1 or 2.
SPIR-SSW41	Soil & water	Further assessment involving geotechnical boreholes, monitoring boreholes and water quality testing at cutting sites will be undertaken at Type A cutting sites to monitor impacts on local groundwater reserves.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	Significant installation and monitoring has been undertaken to date with further monitoring as per the approved Water Quality Management Plan.
SPIR-SSW42	Soil & water	Where groundwater is released, recharge of the water table is the preferred option of managing groundwater. This will be facilitated by collecting groundwater in grassed swales for infiltration back to the groundwater source. Where possible, these swales will divert the groundwater around the construction area so that the groundwater does not further mix with construction runoff.	All	All	Construction	Pacific Complete/ Contractor	Noted
SPIR-SSW43	Soil & water	If recharging is not possible or suitable, then discharging groundwater will be collected via the sedimentation basins before discharge into natural waterways. If discharging to downstream groundwater, then the potential effects of mounding[1] will be mitigated.	All	All	Pre-construction	Pacific Complete/ Contractor	Noted

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-SSW44	Soil & water	Dewatering of excavations will be undertaken in line with Roads and Maritime' Technical Guideline – Environmental Management of Construction Site Dewatering (Roads and Maritime, 2011c), and in accordance with any licence conditions.	All	All	Construction	Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-SSW45	Soil & water	Further investigations will be undertaken to identify any impacts from contaminated groundwater from the former landfill sites at Firth Heinz Road and Crowleys Road.	3	Stage 2	Pre-construction Detailed Design	Pacific Complete	NA
SPIR-SSW46	Soil & water	The proposed management strategy to address potential impacts at type A cuttings includes: • Pre-works investigations – geotechnical investigations to determine groundwater condition (quality parameters: electrical conductivity, groundwater depth, geological information), presence of actual or potential acid sulfate soils, presence or potential of salinisation, establishing groundwater monitoring sites, and gathering of other pertinent information. • Assessment – including the EIS assessment, the pre-works investigations carried out, groundwater modelling of cuts (and the Rous Water Woodburn borefield site), and predictions made from those results. • Monitoring – to assess whether the investigation and its predictions are accurate and to instigate early intervention in the unlikely case/s that the actual outcomes deviate from predictions. Monitoring start before construction, and continue during construction. Monitoring also continue into the operation phase of the project. • Mitigation – implement environmental and engineering management measures where predictions and/or modelling and monitoring suggest that these are required to minimise impacts on groundwater.	All	All	Pre-construction Detailed Design Construction	Pacific Complete	The Water Quality Monitoring Program for Sections 1 & 2 was approved by the Department of Planning & Environment on the 8/5/15. RMS continues to monitor groundwater levels and water quality in accordance with the approved Program -
SPIR-SSW47	Soil & water	The monitoring of locations in the vicinity of type B cuttings and major embankments will commence before construction to identify the need to implement any mitigation measure.	All	All	Pre-construction Detailed Design Construction	Pacific Complete	The Water Quality Monitoring Program for Sections 1 & 2 was approved by the Department of Planning & Environment on the **8/5/15.** Significant installation and monitoring has been undertaken to date with further monitoring as per the approved Water QMProgram.
SPIR-SSW48	Soil & water	If required to manage groundwater impacts at type A and type B cuttings and major embankments, the following engineering mitigation measures will be considered: • Engineering measures that transfer the seepage water downstream. Standard practice will be to collect the seepage from the cut face in the drainage system for the highway, which will be diverted into water quality basins before being released back into the creek or natural drainage system at some point downstream. • Engineering impact mitigation measures that transfer the seepage water (where present) into the groundwater ecosystem immediately downslope of the cutting or embankments.	All	All	Pre-construction Detailed Design Construction	Pacific Complete	The Water Quality Monitoring Program for Sections 1 & 2 was approved by the Department of Planning & Environment on the **8/5/15.** Significant installation and monitoring has been undertaken to date with further monitoring as per the approved Water QMProgram.
SPIR-SSW49	Soil & water	Major embankments will be designed to enable distributed flow of surface waters.	All	All	Pre-construction Detailed Design Construction	Detailed Designer	Addressed during detailed design
SPIR-SSW50	Soil & water	Measures to manage high-risk groundwater impact areas will continue to be considered through the detailed design process. In identified areas, the design of water quality controls will be reviewed and the need for additional controls may be identified.	All	All	Pre-construction Detailed Design Construction	Pacific Complete/ Detailed Designer	Significant installation and monitoring has been undertaken to date with further monitoring as per the approved Water QMProgram.
SPIR-SSW51	Soil & water	Where reasonable and feasible, sites used for batch plants, refuelling and chemical storage will be managed so that no groundwater intrusion occurs.	All	All	Pre-construction Construction	Pacific Complete/ Contractor	Noted
SPIR-SSW52	Soil & water	All construction runoff to the Rous Water bore fields will be diverted to appropriate sedimentation controls basins. No runoff will bypass the basins untreated, regardless of the size of the footprint of the work. In addition, all basins in the bore fields will be clay lined to prevent seepage. If required, the depth of the basins will be reduced from the standard depth of two metres to one metre in these areas to avoid penetration of the natural clay layer, with the volume of the basins maintained by increasing their footprint where reasonable and feasible.	8	Stage 2	Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	NA
SPIR-SSW53	Soil & water	Sizing of sedimentation basins in the Rous Water bore fields will be reviewed to consider the use of 90th percentile basins.	8	Stage 2	Detailed Design Construction	Pacific Complete/ Detailed Designer	NA
SPIR-SSW54	Soil & water	The following construction activities will not be permitted within the Rous Water bore field catchment without additional control measures to reduce risk of impact to the borefield and groundwater: • Refuelling. • Washdown. • Storage of chemicals or other hazardous substances. • Installation of concrete batch plants.	8	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-SSW55	Soil & water	Water quality ponds will be designed to be shallower between stations 131.1 and 134.0 (namely one metre compared to two metres) to avoid penetration of the natural clay layer, where possible. Alternatively, where not feasible, clay capping/ lining of the basin will be undertaken or consideration of appropriately designed swales.	8	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-SSW56	Soil & water	Alternative operational water quality management measures such as the use of biofilters, sand filters or measures used in the Tintenbar to Ewingsdale Pacific Highway upgrade project will be considered during detailed design.	8	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-SSW57	Soil & water	Consultation will be undertaken with Rous Water to co-ordinate mitigation actions including the definition of appropriate buffer zones between the project and bores.	8	Stage 2	Pre-construction	Pacific Complete	NA
SPIR-SSW58	Soil & water	Consultation will be undertaken with Rous Water to address the 12 elements of the Australian Drinking Water Guidelines Management Framework.	8	Stage 2	Pre-construction	Pacific Complete	NA
SPIR-SSW59	Soil & water	All permanent water quality basins will incorporate measures to contain accidental fuel and chemical spills resulting from vehicle accidents on the highway. Basins will be designed to accommodate a spill volume of up to 40,000 litres.	All	All	Detailed Design Operation	Pacific Complete/ Detailed Designer	Addressed during detailed design
SPIR-SSW60	Soil & water	For water quality treatment in floodplains and other locations with minimal changes in gradient, grassed swales will be considered during detailed design.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	Addressed during detailed design
SPIR-SSW61	Soil & water	Appropriate scour protection for drainage measures will be determined during detailed design.	All	All	Detailed Design Operation	Pacific Complete/ Detailed Designer	Addressed during detailed design and as per the SWMP
SPIR-SSW62	Soil & water	Surface water quality monitoring will be undertaken in accordance with Roads and Maritime' Guideline for Construction Water quality Monitoring (RTA, 2003), and as per the framework outlined in the Working paper – Water quality.	All	All	Pre-construction	Pacific Complete/ Contractor	The Water Quality Monitoring Program for Sections 1 & 2 was approved by the Department of Planning & Environment on the **8/5/15.**
SPIR-SSW63	Soil & water	Groundwater monitoring will be undertaken in accordance with the framework outlined in the Working paper – Groundwater (Section 5.2).	All	All	Construction	Pacific Complete/ Contractor	The Water Quality Monitoring Program for Sections 1 & 2 was approved by the Department of Planning & Environment on the **8/5/15.** RMS continues to monitor groundwater levels and water quality in accordance with the approved Program -
SPIR-SSW64	Soil & water	Consultation will be undertaken with Department of Defence regarding the potential for unexploded ordnance to be encountered east of Broadwater.	9	Stage 2	Pre-construction	RMS/ Pacific Complete	NA
Transport &Traffic							
SPIR-T&T1	Traffic & Transport	Construction traffic management plans will be prepared and implemented for work sites. They will include: • Identification of all public roads to be used by construction traffic. • Management methods to direct construction traffic to use identified roads. • Identification of all public roads that may be partially or completely closed during construction, and the expected timing and duration of closures. • Details on likely impacts on existing traffic (including pedestrians, vehicles, cyclists and disabled persons). • Temporary traffic arrangement measures, including property access. • Details on access to construction sites, including entry and exit locations, and measures to prevent construction vehicles queuing on public roads. • A response plan for any incident involving construction traffic. • Mechanisms for monitoring, reviewing and amending the success of the plans. The traffic management plans be prepared in consultation with councils.	All	All	Pre-construction Construction	Pacific Complete/ Contractor	Included in approved Construction Traffic and Access Management Plan
SPIR-T&T2	Traffic & Transport	A strategy will be prepared for bulk earthworks haulage between the crossing of the Richmond River and the interchange at Wardell. The strategy will seek to maximise the extent of haulage within the project boundary and limit the need to haul material through the town of Wardell.	10	Stage 2	Pre-construction Construction	Pacific Complete/ Contractor	NA

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-T&T3	Traffic & Transport	Traffic control schemes will be inspected as follows: • Pre-start and pre-closedown inspections of short-term traffic controls. • Weekly inspections of long-term traffic controls. • Night-time inspections of long-term traffic controls.	All	All	Construction	Pacific Complete/ Contractor	Included in approved Construction Traffic and Access Management Plan
SPIR-T&T4	Traffic & Transport	Vehicle movement plans and haulage route plans will be prepared. Drivers will be briefed on these vehicle movement plans during project induction. Deliveries be planned to occur outside peak traffic periods, where possible. To minimise queuing of construction vehicles on the highway, site personnel use two-way radios to call up haulage trucks from layover areas on a 'just in time' basis.	All	All	Construction	Pacific Complete/ Contractor	Included in approved Construction Traffic and Access Management Plan
SPIR-T&T5	Traffic & Transport	Applications for Road Occupancy licences will be submitted to Roads and Maritime Services and the relevant council at least 10 working days prior to proposed occupancy.	All	All	Pre-construction Construction	Pacific Complete/ Contractor	Included in approved Construction Traffic and Access Management Plan
SPIR-T&T6	Traffic & Transport	Pre-construction road dilapidation reports will be prepared for all roads likely to be used by construction traffic. Post-construction road dilapidation reports will be prepared following the completion of construction for all roads assessed prior to construction. Dilapidation resulting from construction activity will be repaired. Copies of road dilapidation reports will be sent to the relevant roads authority.	All	All	Pre-construction Construction	Pacific Complete/ Contractor	Included in approved Construction Traffic and Access Management Plan
SPIR-T&T7	Traffic & Transport	Access be maintained to properties during construction including, where necessary and feasible, temporary alternative access unless otherwise agreed with property owners. Where any legal access is permanently affected, alternative access to an equivalent standard to and from a public road will be provided where a property has no other legal means of access and where such alternative access is feasible and practical. Where alternative access arrangements are not feasible or practical and a property is left with no access to a public road, negotiations will be undertaken with the relevant property owner for acquisition of the property in accordance with the provisions of the Land Acquisition (Just Terms Compensation) Act 1991.	All	All	Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	Included in approved Construction Traffic and Access Management Plan
SPIR-T&T8	Traffic & Transport	Where changes in access affect bus stop locations, temporary alternatives will be provided in conjunction with bus operators and affected schools to maintain access during construction.	All	All	Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	Consultation with landowners and businesses has been ongoing to discuss upcoming changes in traffic or access arrangements.
SPIR-T&T9	Traffic & Transport	Where access to State forest land is affected during construction, a new access route will be provided in consultation with the Department of Primary Industries (Forests NSW).	All	All	Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	Any access through State Forest, the project has liaised with State Forest including occupancy of land.
SPIR-T&T10	Traffic & Transport	Where maritime traffic access to the Clarence and Richmond rivers is affected during construction of bridge crossings, appropriate signage will be provided indicating alternative means of access and the timing of the works.	5 and 10	Stage 2	Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	NA
SPIR-T&T11	Traffic & Transport	Access to the Clarence and Richmond rivers will be maintained for industry and recreational waterway users.	5 and 10	Stage 2	Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	NA
SPIR-T&T12	Traffic & Transport	Access to Glenugie State Forest around the interchange at Eight Mile Lane and Lookout Road will be further reviewed in consultation with State Forest Corporation.	3	Stage 2	Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	NA
SPIR-T&T13	Traffic & Transport	The layout of the intersection at Yamba Road will be reviewed to better meet the needs of truck movements from Harwood Mill, where reasonable and feasible.	5	Stage 2	Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	NA
SPIR-T&T14	Traffic & Transport	The need for a full interchange at Yamba Road will be investigated should traffic growth warrant it in the future and when funding is available.	5	Stage 2	Detailed Design Construction	Pacific Complete	NA
SPIR-T&T15	Traffic & Transport	The need for a full interchange with south facing ramps at Watts Lane, Harwood will be investigated should traffic growth warrant it in the future and when funding is available.	5	Stage 2	Detailed Design Construction	Pacific Complete	NA
SPIR-T&T16	Traffic & Transport	The need for the overpass and the arrangement of local access at Chatsworth Road will be reviewed at the detailed design stage depending on specific staging and delivery of the highway.	5	Stage 2	Detailed Design Construction	Pacific Complete/ Detailed Designer/	NA
SPIR-T&T17	Traffic & Transport	The need for the overpass and arrangement of local access at Carrols Lane will be reviewed at the detailed design stage depending on specific staging and delivery of the highway.	5	Stage 2	Detailed Design Construction	Pacific Complete/ Detailed Designer/	NA
SPIR-T&T18	Traffic & Transport	Connectivity between the shared user path from Harwood Bridge to Yamba Road would be reviewed to refine pedestrian and cyclist access	5	Stage 2	Detailed Design Construction	Pacific Complete/ Detailed Designer/	NA
Urban Design							
SPIR-UD1	Urban Design & Landscape	If further noise modelling identifies that noise walls are required, further visual assessment address the visual implications of the change. Their location and design will be in accordance with the Noise Wall Design Guideline (RTA, 2007) and the principles identified in Working Paper – Urban design, Landscape Character and Visual Impact (Section 4.6.3).	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	For sections 1 & 2, An Urban Design and Landscape Plan has been submitted and approved by the Department of Planning & Environment on the **8/5/15**
SPIR-UD2	Urban Design & Landscape	Changes to the design of the Clarence and Richmond rivers bridges from this EIS, will require further visual assessment. Any changes will consider the principles identified in Working Paper – Urban design, Landscape Character and Visual Impact (Section 4.6.2), the performance criteria outlined in Chapter 5 of the EIS and funding arrangements.	5, 9, 10	Stage 2	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	NA
SPIR-UD3	Urban Design & Landscape	The project will be carried out in accordance with the urban design and landscaping strategy, as identified in Section 11.4.1 of this EIS. Detailed landscape design for all project batters, and median planting areas will be developed in accordance with the Landscape Guidelines (RTA, 2008), the requirements of the Working Paper – Biodiversity (Section 5.2.2) and the landscape strategy to provide a robust, successful and effective planting design.	All	All	Pre-construction	Pacific Complete/ Contractor	For sections 1 & 2, An Urban Design and Landscape Plan has been submitted and approved by the Department of Planning & Environment on the **8/5/15**
SPIR-UD4	Urban Design & Landscape	The built form of the project, including consideration of the height, bulk, scale, materials and finishes for: • Bridges. • Retaining walls. • Cuttings and embankments. • Road barriers. • Signage. • Fences. • Clear zones. • Topsoil management. • Water quality control ponds. • Fauna crossing. • Place marking and cultural plantings. The project will be designed in accordance with the design principles identified in Working Paper – Urban Design, Landscape Character and Visual Impact, and relevant Roads and Maritime guidelines.	All	All	Pre-construction Detailed Design	Pacific Complete/ Detailed Designer	For sections 1 & 2, An Urban Design and Landscape Plan has been submitted and approved by the Department of Planning & Environment on the **8/5/15**
SPIR-UD5	Urban Design & Landscape	Further assessment will be undertaken of the impact of overshadowing on areas surrounding the project, particularly around Harwood Bridge, interchanges and overpasses near residential properties.	All	All	Pre-construction	Pacific Complete	NA
SPIR-UD6	Urban Design & Landscape	Measures to mitigate visual impacts to viewpoints will be implemented, as identified in Table 11-42 and Working Paper – Urban Design, Landscape Character and Visual Impact. If any further viewpoints were identified during detailed design that have a moderate–high or high impact, screen planting also be considered.	All	All	Construction	Pacific Complete/ Contractor	For sections 1 & 2, An Urban Design and Landscape Plan has been submitted and approved by the Department of Planning & Environment on the **8/5/15**
SPIR-UD7	Urban Design & Landscape	Disturbed areas will be progressively revegetated throughout the construction period.	All	All	Construction	Pacific Complete/ Contractor	Included as part of approved Construction Soil and Water Management Plan
SPIR-UD8	Urban Design & Landscape	Where required, typical landscape treatments for ancillary facilities in forest areas will include: • Providing screen planting. • Considering reinstatement of disturbed forest in heavily forested. • Considering the importance of the visual landscape at each location and allowing restoration of important forest vegetation to prominent ridge lines or other landscape elements where feasible and reasonable. • Negotiating with private landowners, as applicable, to determine future treatments for other non-forested ancillary facility locations. • Re-grading disturbed areas to achieve a sustainable and functional landform. • Stabilising all surfaces in accordance with good engineering and environmental practice.	All	All	Construction	Pacific Complete/ Contractor	Noted

Mitigation No.	Category	Management Measure	Section	Stage	Timing	Responsibility	Reference / Comment
SPIR-UD9	Urban Design & Landscape	Typical landscape treatments for ancillary facilities in agricultural areas will include: • Considering returning remnant agricultural land to agricultural uses. • Providing screen planting. • Reinstating riparian vegetation through ancillary facilities, where practicable, in the open landscape. • Considering the visual landscape at each ancillary facility and considering restoration of important forest vegetation to prominent ridge lines or other landscape elements where feasible and reasonable. • Re-grading disturbed areas to achieve a sustainable and functional landform. • Stabilising all surfaces in accordance with good engineering and environmental practice.	All	All	Construction	Pacific Complete/ Contractor	Noted
SPIR-UD10	Urban Design & Landscape	The extent of excavation and the landscaping strategy at borrow sites will be reviewed considering material requirements on the project and the visual impact on the resultant cuttings.	All	All	Pre-construction	Pacific Complete/ Detailed Designer	Not applicable for Sections 1 & 2 as there are no Borrow sites
SPIR-UD11	Urban Design & Landscape	Any backfilling of the Lang Hill and West of Wardell borrow sites will be undertaken with available surplus material from the project. Rehabilitation of the sites will be undertaken in accordance of the landscape strategy (UD3), design principles (UD5) and the intended future land use of the sites.	8 and 10	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-UD12	Urban Design & Landscape	Any backfilling of the Eatons and Gibson borrow sites will be undertaken with available surplus material from the project. Landscaping on the site use indigenous species, including those species suitable for Koala. The landscaping will connect to the existing vegetation to the east of the project by a fauna land bridge to be constructed at station 147.6. Rehabilitation of the sites will be undertaken in accordance of the landscape strategy (UD3) and design principles (UD5).	10	Stage 2	Construction	Pacific Complete/ Contractor	NA
SPIR-UD13	Urban Design & Landscape	Landscape and rehabilitation works will be monitored and remedial measures implemented where required until vegetation has stabilised.	All	All	Operation	Pacific Complete	Noted
SPIR-UD14	Urban Design & Landscape	The mounding profile of any earth mound will blend suitably into the existing landscape setting. Any mounding to be landscaped will be compacted in 1.5 metre layers with 1:3 maximum batter slopes where reasonable in consideration of constraints within the project corridor. Where feasible and reasonable, permanent mounds will be treated with ameliorants and overlaid with topsoil to minimum 150 millimetres to ensure suitable planting conditions are achieved.	All	All	Detailed Design Construction	Pacific Complete/ Detailed Designer/ Contractor	For sections 1 & 2, An Urban Design and Landscape Plan has been submitted and approved by the Department of Planning & Environment on the **8/5/15**
Waste Management							
SPIR-WM1	Waste	The cut-and-fill balance of the project will be further refined to obtain as much material as possible for reuse on the project.	All	All	Pre-construction	Pacific Complete	Earthwork balances have been achieved for Sections 1 & 2
SPIR-WM2	Waste	A resource management strategy will be prepared for construction of the project to identify the hierarchy for sourcing and use of resources. It include the following provisions: • Available project cutting material (including Select Material Zone (SMZ) and verge material) will be used for the construction of embankments, SMZ and verge within that section to the extent that it is suitable. • Project sections with a deficit in material import surplus material from other project sections in preference to external sources. • Where possible, the distances that earthworks materials are moved across the project as a whole be minimised, notwithstanding the above two requirements. • Contractors will reduce the amount of unsuitable waste generated during excavations, where feasible (eg treatment at source). • The generation and management of unsuitable material during project earthworks will be monitored to ensure appropriate management of the issue. The resource management strategy will also identify: • Details on materials that be sourced from the project (including location and type). • Viable material suppliers (including water) near the project. • Proposed sustainable material sources practices (such as use of recycled materials or wastewater). • Materials that could be recycled and re-used on-site or transferred to other project sections.	All	All	Pre-construction Construction	Pacific Complete/ Contractor	The project have an approved Earthworks Management Plan which outlines all of these requirements.
SPIR-WM3	Waste	A waste register will be maintained by each contractor, detailing types of waste collected, amounts, date, time, and details of disposal.	All	All	Construction	Pacific Complete/ Contractor	The project have a current waste register which is continually updated.
SPIR-WM4	Waste	Where possible, materials will be bought in bulk to minimise the amount of package required. Sources of material that have sustainable packaging design, recycled and recyclable packaging will be favoured over other material sources where cost effective.	All	All	Construction	Pacific Complete/ Contractor	All materials are purchased in bulk to reduce packaging.
SPIR-WM5	Waste	Waste material generated on-site (including chemical, fuel and lubricant containers, and solid and liquid wastes) will be classified and disposed of in accordance with the Protection of the *Environment Operations Act 1997* and Waste Classification Guidelines Part 1: Classifying Waste (DECCW, 2009).	All	All	Construction	Pacific Complete/ Contractor	The waste register classifies the different wastes generated onsite according the required classifications.
SPIR-WM6	Waste	Waste minimisation and management measures will be developed based on the principles in the Waste Avoidance and Resource Recovery Act 2001, the NSW Government's Waste Reduction and Purchasing Policy, and waste exemptions including: • Excavated Natural Material Exemption (EPA, 2008)). • Excavated Public Road Material Exemption (EPA, 2012)). • Raw Mulch Exemption (EPA, 2008). • Reclaimed Asphalt Pavement Exemption (EPA, 2012). • Recovered Aggregate Exemption (EPA, 2010). • Stormwater Exemption (EPA, 2008). • Treated Drilling Mud Exemption (EPA, 2011). Measures seek to avoid, minimise, re-use, recycle, treat or dispose of waste streams during construction and address transport and disposal arrangements.	All	All	Construction	Pacific Complete/ Contractor	There is a focus on waste reduction, for example reducing the amount of fabric to cover batters, where a binder can be used instead. Reusing fabric multiple times occurs regularly. Not over ordering of materials also occurs by stringent procurement process. There are minimal wastes which are transported offsite.
SPIR-WM7	Waste	Millable timber will be harvested for reuse off site. All other felled timber will be reused on-site in the form of habitat recreation or mulch in landscaping and erosion and sedimentation controls. Where mulch cannot be reused on-site, consideration will be given to making the mulch available to the public in accordance with the Roads and Maritime Environmental Direction 25 (2012) and the Raw Mulch Exemption (EPA, 2008).	All	All	Construction	Pacific Complete/ Contractor	Millable timber has been harvested for offsite use including blueberry poles, cogeneration plant, & firewood. The project have a project Raw Much Exemption which has been regularly applied for various landowners.
SPIR-WM8	Waste	Sediment removed from sedimentation basins will be used, where appropriate, on-site in landscaping and/or flattening of batters.	All	All	Construction	Contractor	Desilting sedimentation basins commenced in December 2015, whereby sediment was reused into earthworks, fill, etc
SPIR-WM9	Waste	Where feasible, the contractor will be required to re-use materials. This could include, but is not limited to, concrete formwork or surplus concrete pours.	All	All	Construction	Contractor	Reuse of concrete, timber, plastic, fabric regularly occurs on the project within the various disciplines ie structures, earthworks, etc
SPIR-WM10	Waste	Site inductions and on-site training will be required to include waste minimisation principles and measures.	All	All	Construction	Pacific Complete/ Contractor	The project induction includes a component on waste management.
SPIR-WM11	Waste	At site compounds, on-site recycling facilities will be provided for recycling paper, plastic, glass and other re-useable materials.	All	All	Construction	Pacific Complete/ Contractor	There are recycling facilities at each compound area.
SPIR-WM12	Waste	Regular visual inspections will be conducted to ensure that work sites are kept tidy and to identify opportunities for reuse and recycling.	All	All	Construction	Pacific Complete/ Contractor	Site housekeeping is regularly discussed at daily toolboxes, induction, pre-starts and continually enforced by Environment Team & General Superintendent
SPIR-WM13	Waste	Water captured in excavations will be required to be either: • Managed in accordance with the construction Soil and Water Management Plan. • Transferred to a licensed sediment basin, treated and discharged in accordance with any licence conditions that apply to the discharge of water, or, • Re-used for construction water or dust suppression.	All	All	Construction	Contractor	Any site water is captured in sedimentation basins, sumps, or other. This water is tested, treated and discharged in accordance with the SWMP & EPL 20590, or used as dust suppression.
SPIR-WM14	Waste	Appropriate waste and recycling facilities will be provided at rest areas and heavy vehicle checking stations.	All	All	Operation	Pacific Complete/ Contractor	Not applicable to project. Recycling & waste facilities are provided inside the project boundary for construction materials.
SPIR-WM15	Waste	All operational waste will be managed in accordance with the Roads and Maritime waste management procedures and Environmental Management System.	All	All	Operation	RMS	Included in approved CWEMP
SPIR-WM16	Waste	Collection and removal of roadside litter will be undertaken in accordance with the Roads and Maritime Environmental Management System.	All	All	Operation	RMS	Included in approved CWEMP
SPIR-WM17	Waste	Sediment removed from operational water quality basins will , where appropriate, be classified in accordance with the Waste Classification Guidelines (DECCW, 2009), and be disposed of in accordance with the *Protection of the Environment Operations (Waste) Regulation 2005* .	All	All	Operation	RMS	Sediment will be beneficially reused where ever feasible

Appendix B – Summary Monitoring Data

W2HC Noise Monitoring Locations and Catchments

Figure 1-1 Project layout, Noise Catchment Areas and noise monitoring locations

Woolgoolga to Halfway Creek

Noise Monitoring

EPL:20590

	L_{eq} above the predicted noise level

Month	Date	Approximate Chainage	Noise monitoring location[1]	Operator	Start Time	End Time	Construction Activity	Predicted / Objective Leq	Leq	Lmax	Lmin	L10	L90	Comments
June	27/06/2016	1300 East	R228-Eggins Drive	Dallas Nixon	1320	1335	Eggins Dve - No construction works occurring. Placing Select Material Nth Bnd.	59	49.4	61.9	41.9	51.9	45.5	No works I immediate area, local holiday park traffic and Pacific highway. Placing select in Nth Bnd (west of existing) Measured Leq of 49.4 dB(A) is less than the predicted Leq of 59 dB(A).
	27/06/2016	5200 East	R414-Post Office Lane	Dallas Nixon	1125	1140	Culvert 566 backfill and permanent scour works.	58	52.1	60	47.1	54.4	48.9	Highway traffic noise clearly dominating the sound level meter records. Measured Leq of 52.1 is less than the predicted Leq of 58dB(A).
	27/06/2016	9000 East	R468-Dirty Ck Rd south	Dallas Nixon	1250	1305	Permanent works occuring at Slop hole	56	54.7	79	42.3	53.8	44.3	Measured Leq of 54.7 dB(A) is Less than predicted value of 56 dB(A). Tonal alarms audible at times when Pacific Highway traffic noise level was low. Exhaust brakes of trucks on highway and local cars primary sources.
	27/06/2016	11400 East	R481-Dirt Ck Range	Dallas Nixon	1230	1245	Select material placement. RR overpass bridge works.	58	47.7	57.8	44.7	48.9	46.2	Measured Leq of 47.7 dB(A) is Less than objective/predicted value of 58 dB(A).Pacific Highway predominant noise source.
	27/06/2016	14100 East	R526-Northern extent	Dallas Nixon	1155	1210	Finishing works McPhillips Road. Culvert works 1448	55	48	63.4	40.6	50.2	44.3	Measured Leq of 48 dB(A) is Less than objective/predicted value of 55 dB(A). 30t excavator bucket working at 1448 was audible above traffic at times.
July	19/07/2016	1300 East	R228-Eggins Drive	Dallas Nixon	1200	1215	Drain construction - Eggins Sth	59	51.7	61.5	42.5	52.2	43	Local holiday park traffic and Pacific highway Measured Leq of 51.7 dB(A) is less than the predicted Leq of 59 dB(A).
	19/07/2016	5200 East	R414-Post Office Lane	Dallas Nixon	1245	1300	Backfill and finishing works Culvert 566. Placing select material	58	50.2	56.1	46.2	50.3	49	Highway traffic noise clearly dominating the sound level meter records. Measured Leq of 50.2 is less than the predicted Leq of 58dB(A).
	19/07/2016	9000 East	R468-Dirty Ck Rd south	Dallas Nixon	1130	1145	Traffic swithed onto RRE. E/Works west of Alignment.	56	52	70.2	40.3	51.3	41.8	Highway trucks (exhaust brakes) and traffic noise clearly dominating the sound level meter records. Measured Leq of 52 is less than the predicted Leq of 56dB(A).
	19/07/2016	11400 East	R481-Dirt Ck Range	Dallas Nixon	1605	1620	Bulk e/works/Rock hammering RRW. Traffic now switched onto RRE	58	47.3	54.9	40.1	49.5	43.5	Hwy traffic now closer to monotoring location; And is predominant noise. Rock breaking and loading and unloading evident in distance. Measured Leq of 47.3 dB(A) is Less than objective/predicted value of 58 dB(A)
	19/07/2016	14100 East	R526-Northern extent	Dallas Nixon	1105	1120	No works occuring at time.	55	47.8	58.9	42.1	47.9	45.8	Measured Leq of 47.8 dB(A) is Less than objective/predicted value of 55 dB(A)
August	29/08/2016	1300 East	R228-Eggins Drive	Dallas Nixon	1000	1015	Fill import and placement - Eggins stage 2	59	54.2	62	43	56.9	43	Construction works; Local holiday park traffic; and Pacific highway Measured Leq of 54.2 dB(A) is less than the predicted Leq of 59 dB(A).
	29/08/2016	5200 East	R414-Post Office Lane	Dallas Nixon	1040	1055	Placing SMZ Cut/Fill 5	58	49.2	55.3	45.8	49	48.1	Highway traffic noise clearly dominating the sound level meter records. Measured Leq of 49.2 is less than the predicted Leq of 58dB(A).
	29/08/2016	9000 East	R468-Dirty Ck Rd south	Dallas Nixon	1230	1245	Traffic swithed onto RRE. E/Works west of Alignment.	56	53	71.2	41.3	52.3	41.8	Highway trucks (exhaust brakes) and traffic noise clearly dominating the sound level meter records. Measured Leq of 53 is less than the predicted Leq of 56dB(A).
	29/08/2016	11400 East	R481-Dirt Ck Range	Dallas Nixon	1405	1420	Pavement drainage works - West of alignment	58	49.3	55.1	42	52.4	45.9	Measured Leq of 49.3 dB(A) is Less than objective/predicted value of 58 dB(A)
	29/08/2016	14100 East	R526-Northern extent	Dallas Nixon	1500	1515	No works occuring at time.	55	47.8	58.9	42.1	47.9	45.8	Measured Leq of 47.8 dB(A) is Less than objective/predicted value of 55 dB(A)
September	29/09/2016	1300 East	R228-Eggins Drive	Dallas Nixon	1110	1125	Fill import and placement - Eggins stage 2	59	57.7	63.5	45.7	54.4	47	Construction works; Local holiday park traffic; and Pacific highway Measured Leq of 57.7 dB(A) is less than the predicted Leq of 59 dB(A).
	29/09/2016	5200 East	R414-Post Office Lane	Dallas Nixon	1135	1150	Placing Select / Permanent works - Topsoilong etc	58	54.4	68.4	46.9	56.4	51.6	Highway traffic noise clearly dominating the sound level meter records. Measured Leq of 54.4 is less than the predicted Leq of 58dB(A).
	29/09/2016	9000 East	R468-Dirty Ck Rd south	Dallas Nixon	1040	1055	Bulk Earthworks - Fill 10	56	51.9	69.3	37.1	43.1	44.8	Highway trucks (exhaust brakes) and traffic noise clearly dominating the sound level meter records. Measured Leq of 51.9 is less than the predicted Leq of 56dB(A).
	29/09/2016	11400 East	R481-Dirt Ck Range	Dallas Nixon	915	935	Drainage Blanket Cut 14 - Rigid tippers; Dozer; Rollers	58	46.4	59.5	34.1	51.8	38.3	Measured Leq of 46.4 dB(A) is Less than objective/predicted value of 59 dB(A).
	29/09/2016	14100 East	R526-Northern extent	Dallas Nixon	1310	1325	No works occuring at time.	55	47.4	67.3	35.4	44.3	49.9	Measured Leq of 47.4 dB(A) is Less than objective/predicted value of 55 dB(A).
October	28/10/2016	1300 East	R228-Eggins Drive	Dallas Nixon	1321	1336	Swith prep. Northbound (west of existing highway)	59	50.5	62	43.8	52.5	45.6	Works inaudible above existing traffic on Pac Hwy and Eggins drive.
	28/10/2016	5200 East	R414-Post Office Lane	Dallas Nixon	1143	1158	Sealing works	58	49.2	64.1	43.1	51	45.9	Existing Pac highway and bird calls dominating readings.
	28/10/2016	9000 East	R468-Dirty Ck Rd south	Dallas Nixon	1232	1247	Pavement drainage works - Fill 9; Cut to fill work (fill 10)	56	54.6	72.2	42.6	57.8	46.7	Various birds in adjacent trees (<15m) dominating readings.
	28/10/2016	11400 East	R481-Dirt Ck Range	Dallas Nixon	1255	1310	Concrete paving	58	47	57.4	39.5	49.9	42.6	Concrete trucks for paver audible; Exhaust brakes of rd trucks dominating readings.
	28/10/2016	14100 East	R526-Northern extent	Dallas Nixon			No works occuring at time.	55						

W2HC Dust Monitoring Locations

DDG Number	Chainage	Description
DDG#1	CH1300	Darlington Holiday Park, east side of alignment
DDG#2	CH2500	Kangaroo Trail Road Compound, east side of alignment
DDG#3	CH3200	Dance Studio, west side of alignment
DDG#4	CH5250	Post Office Lane, east side of alignment
DDG#5	CH6200	Corindi Access Road, Blueberry Farm, east side of alignment
DDG#6	CH7550	Crushing & Screening Operations, private resident east of alignment
DDG#7	CH7800	Large cut operations, west side of alignment
DDG#8	CH9450	Blueberry Packing Shed, west side of alignment
DDG#9	CH10100	Farming operations east of alignment
DDG#10	CH12300	Property close immediately east of alignment
DDG#11	CH14100	Private residents, east of alignment
DDG#12	CH8800	Control Site - Blueberry Farm, west of alignment

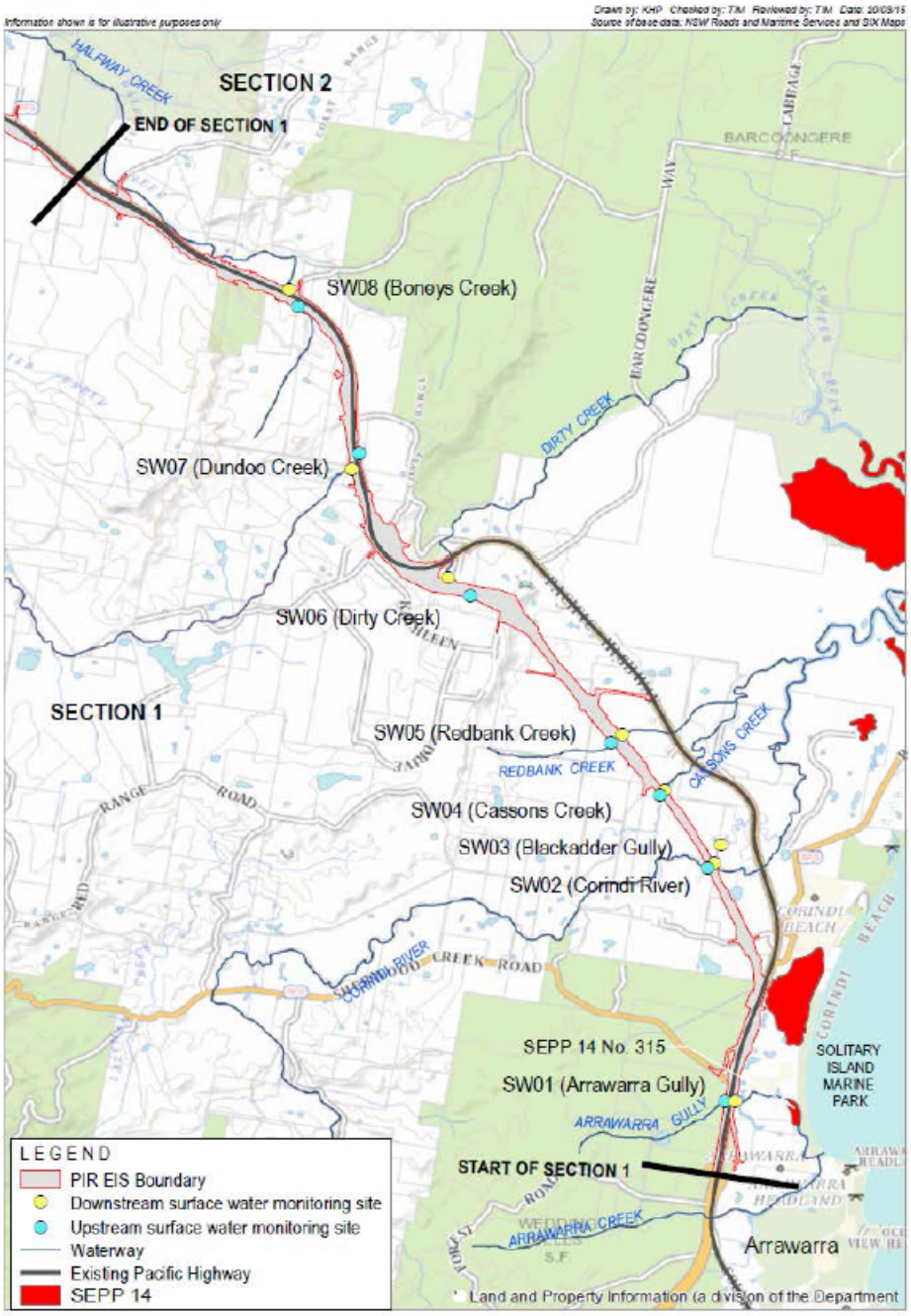
Dust Monitoring

Exceedance of 4g/m^2/month criteria

Month	Date From	Date To	Operator	Chainage	Location	Lab Results							Lab sample comments	Notes
						Criteria (g/m^2/month)	Total Suspended Solids (g/m^2/month)	Total Suspended Solids (mg/m^2/day)	Ash (g/m^2/month)	Combustible Matter (g/m^2/month)	Soluble Matter (g/m^2/month)	Total Solids (g/m^2/month)		
June	5/05/2016	7/06/2016	Dallas Nixon	1200 - East	DDG - 1	4	2,412.4	73102	2201.4	210.9	6.2	2418.6	Brown/ dirt in sample	Guage tampered with
				2500 - East	DDG - 2		2.1	63	1.4	0.7	4.3	6.4		
				3200 - West	DDG - 3		3.7	114	3.0	0.7	6.4	10.2		
				5200 - East	DDG - 4		0.9	26	0.5	0.4	4.9	5.8		
				6300 - East	DDG - 5		1.1	32	0.5	0.6	4.5	5.5		
				7500 - East	DDG - 6		1.9	58	1.4	0.5	3.8	5.7		
				7750 - West	DDG - 7		2.9	86	2.7	0.1	3.5	6.4		
				9400 - East	DDG - 8		0.4	13	0.3	0.2	0.5	0.9		
				10000 - East	DDG - 9		2.0	61	0.9	1.1	3.4	5.4		
				12300 - East	DDG - 10		9.1	277	7.1	2.0	4.8	13.9		
				14000 - East	DDG - 11		4.8	146	3.9	0.9	4.3	9.1		
				9400 - West 850m	DDG - 12 Control		1.3	39	0.5	0.8	3.3	4.6		
July	7/6/16	6/07/2016	Nicola Fraser	1200 - East	DDG - 1	4	0.4	13	0.2	0.2	1.2	1.6	Spider ant	
				2500 - East	DDG - 2		0.8	28	0.6	0.2	1.6	2.4		
				3200 - West	DDG - 3		1.7	59	1.4	0.3	1.9	3.6		
				5200 - East	DDG - 4		0.5	18	0.4	0.2	1.3	1.9		
				6300 - East	DDG - 5		0.5	17	0.4	0.1	1.6	2.1		
				7500 - East	DDG - 6		0.7	25	0.5	0.2	1.3	2.0		
				7750 - West	DDG - 7		1.7	57	0.8	0.9	2.1	3.8		
				9400 - East	DDG - 8		1.8	63	1.7	0.1	1.2	3.0	Bee	
				10000 - East	DDG - 9		0.5	19	0.4	0.2	1.6	2.1		
				12300 - East	DDG - 10		1.8	63	1.5	0.3	1.8	3.7	Mosquitos	
				14000 - East	DDG - 11		0.7	23	0.5	0.1	1.5	2.2	Bee	
				9400 - West 850m	DDG - 12 Control		0.3	9	0.2	0.1	1.0	1.3		
August	6/07/2016	5/08/2016	Dallas Nixon	1200 - East	DDG - 1	4	0.2	7	0.1	0.1	4.5	4.7	Ants	
				2500 - East	DDG - 2		0.4	13	0.0	0.4	8.8	9.2	..	
				3200 - West	DDG - 3		0.6	21	0.6	0.0	6.8	7.4	Bugs	
				5200 - East	DDG - 4		0.5	16	0.4	0.1	2.3	2.8	..	
				6300 - East	DDG - 5		0.2	7	0.2	0.0	3.5	3.8	..	
				7500 - East	DDG - 6		2.1	69	1.7	0.4	3.8	5.8	Bugs	
				7750 - West	DDG - 7		1.3	43	0.1	1.2	1.3	2.6	..	
				9400 - East	DDG - 8		1.5	50	1.4	0.1	1.1	2.6	Dead Bees	
				10000 - East	DDG - 9		0.7	22	0.5	0.2	3.3	4.0	..	
				12300 - East	DDG - 10		2.3	77	2.3	0.0	3.1	5.4	..	
				14000 - East	DDG - 11		0.6	21	0.6	0.0	2.5	3.1	..	
				9400 - West 850m	DDG - 12 Control		0.5	18	0.3	0.3	2.9	3.4	..	
September	5/08/2016	6/09/2016	Dallas Nixon	1200 - East	DDG - 1	4	0.2	5	0.1	0.1	0.4	0.5	..	
				2500 - East	DDG - 2		0.5	17	0.4	0.1	0.9	1.4	ants present	
				3200 - West	DDG - 3		4.5	140	4.1	0.3	1.5	6.0	ants present/cloudy colour	
				5200 - East	DDG - 4		0.3	9	0.3	0.0	0.8	1.1		
				6300 - East	DDG - 5		0.4	11	0.3	0.1	0.9	1.3		
				7500 - East	DDG - 6		0.7	21	0.6	0.1	0.7	1.3		
				7750 - West	DDG - 7		0.8	25	0.7	0.1	0.7	1.5		
				9400 - East	DDG - 8		1.6	49	1.5	0.0	0.0	1.5		
				10000 - East	DDG - 9		2.9	90	0.3	2.6	2.0	4.8	cricket/organic matter present/cloudy colour	
				12300 - East	DDG - 10		1.2	37	1.0	0.2	0.8	2.0	ants present	
				14000 - East	DDG - 11		0.5	14	0.4	0.1	0.7	1.1		
				9400 - West 850m	DDG - 12 Control		1.0	32	0.8	0.2	0.7	1.7	ants present	

October	6/09/2016	7/10/2016	Dallas Nixon	1200 - East	DDG - 1	4	0.1	3	0.1	0.0	0.6	0.7	Dry, 0.50L Milli-Q added	
				2500 - East	DDG - 2		26.9	896	21.4	5.5	1.8	28.7	Brown/organic matter	Sample obviously tampered with.
				3200 - West	DDG - 3		4.6	154	4.0	0.6	1.6	6.2	Cloudy	
				5200 - East	DDG - 4		0.4	13	0.2	0.2	0.8	1.2	..	
				6300 - East	DDG - 5		1.4	47	0.6	0.8	1.4	2.8	Brown	
				7500 - East	DDG - 6		1.5	51	1.1	0.4	0.9	2.4	Insects	
				7750 - West	DDG - 7		0.8	26	0.6	0.2	0.8	1.6	Beetle	
				9400 - East	DDG - 8		3.8	126	3.6	0.2	0.8	4.6	Mosquitos/cloudy	
				10000 - East	DDG - 9		1.4	45	0.6	0.8	1.4	2.7	Cricket/cloudy	
				12300 - East	DDG - 10		1.8	59	1.4	0.4	1.1	2.9	Spider/ants	
				14000 - East	DDG - 11		0.3	11	0.3	0.1	0.5	0.8	..	
				9400 - West 850m	DDG - 12 Control		0.8	27	0.6	0.2	0.8	1.6	Ants	
November	7/10/2016	7/11/2016	Dave Keegan	1200 - East	DDG - 1	4	0.8	25	0.2	0.6	0.1	0.9	leaf, organic matter present, yellowish	
				2500 - East	DDG - 2		1.8	57	1.3	0.5	1.5	3.3	beetle, other insects	
				3200 - West	DDG - 3		3.5	114	3.0	0.5	2.0	5.5	cloudy, insects	
				5200 - East	DDG - 4		0.6	20	0.3	0.3	1.2	1.8	insects	
				6300 - East	DDG - 5		1.5	49	1.1	0.4	1.2	2.7	cloudy, insects	
				7500 - East	DDG - 6		2.1	68	0.9	1.2	0.8	2.9	brown, leaf, insects	
				7750 - West	DDG - 7		1.1	35	1.0	0.1	0.5	1.6	insects	
				9400 - East	DDG - 8		2.9	93	2.6	0.2	0.5	3.4	brown, insects	
				10000 - East	DDG - 9		0.7	24	0.5	0.3	0.7	1.5	insects	
				12300 - East	DDG - 10		1.0	32	0.7	0.3	0.5	1.5	cloudy, insects	
				14000 - East	DDG - 11		0.3	9	0.2	0.1	0.6	0.9	dry, 0.20L milli-Q added	
				9400 - West 850m	DDG - 12 Control		0.4	14	0.2	0.2	0.5	0.9	dry, 0.20L milli-Q added	

W2HC Surface Water Quality Monitoring Locations



Section 1 - Woolgoolga to Halfway Creek - Surface Water Monitoring Sites

Monthly Background Surface Water Monitoring (Local Creeks)

Sampling Location	Month Sampled	Comments/Field Observations	Date Sampled	General Monthly Suite													Total Oil and Grease	Nutrients - Dissolved				BTEX						Total Recoverable Hydrocarbons (TRH)							
				Temp	pH	Conductivity mS/cm	Dissolved Oxygen mg/L	Oil and grease-VISIBLE	Total Phosphorus	Total Nitrogen	TSS	TSS Dry P80	TSS Wet P80	Turbidity (lab)	Turbidity (lab) Dry P80	Turbidity (lab) Wet P80		Nitrate	Nitrite	Phosphate	Ammonium	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	Naphthalene	C6-C9	C10-C14	C15-C28	C29-C36	C10-C16	C10-C16 less Naphthalene	C16-C34	C34-C40
				°C	pH	mS/cm	mg/L					mg/L	mg/L				mg/L	mg/L				(µg/L or ppb)						(µg/L or ppb)							
SW01-Arrawarra Gully - US	May Dry	DRY	30/05/2016									19.00	21.00		20.40	71.80																			
SW01-Arrawarra Gully - DS		WQ good.	30/05/2016	11.8	6.6	0.72	11.52	Not visible	0.03	0.51	8.5			11.2			<2.0																		
SW02-Corindi Ck - US		Water quality good. Slight tannin stain	30/05/2016	15.9	6.9	0.25	6.18	Not visible	0.03	0.21	3.0	5.40	4.40	8.8	7.90	9.10	<2.0																		
SW02-Corindi Ck - DS		Water quality good. Slight tannin stain	30/05/2016	15.5	6.8	0.20	4.92	Not visible	0.03	0.19	5.0			12.9			7																		
SW03-Blackadder Gully		DRY	30/05/2016									41.40	79.80		111.80	137.90																			
SW04-Casson's Ck - US		DRY	30/05/2016									13.80	6.40		15.70	28.20																			
SW04-Casson's Ck - DS		DRY	30/05/2016																																
SW05-Redbank Ck - US		DRY	30/05/2016									29.20	63.80		41.30	167.00																			
SW05-Redbank Ck - DS		DRY	30/05/2016																																
SW06-Dirty Ck - US		DRY	30/05/2016									n/a	4.00	13.0	n/a	11.00																			
SW06-Dirty Ck - DS		DRY	30/05/2016											5.0																					
SW06-Dirty Ck - DSB (Boundary)		No flow. Iron staining present	30/05/2016	15.1	6.0	0.45	4.98	Not visible	0.01	0.13	20.5	n/a	n/a	26.0	n/a	n/a	5																		
SW07-Dundoo Ck - US		Algae/organics present. isolated pool	30/05/2016	15.2	6.7	0.48	3.88	Not visible	0.03	0.72	32.7	n/a	19.00	27.0	n/a	45.90	3																		
SW07-Dundoo Ck - DS		DRY	30/05/2016																																
SW08-Boney's Ck - US		No flow. Iron staining present	30/05/2016	15.7	6.5	0.32	7.93	Not visible	0.03	0.28	27.3	12.40	68.00	23.0	13.60	124.20	5																		
SW08-Boney's Ck - DS		No flow. Iron staining present	30/05/2016	15.6	6.8	0.40	8.12	Not visible	0.02	0.35	12.5			31.0			3																		
SW09 Blank (Arrawarra Gully -DS)		n/a	30/05/2016						0.03	0.43	10.0			11.0	n/a	n/a	4																		
SW01-Arrawarra Gully - US	June Wet 5-day Rainfall depth value exceeded (All Stations)	Tannins present (dark). High turb.	7/06/2016	18.3	5.7	0.33	7.36	Not visible	0.02	0.90	480.0	19.00	21.00	42.0	20.40	71.80	4	<0.005	0.008	0.007	0.080	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW01-Arrawarra Gully - DS		Tannin stain. WQ OK.	7/06/2016	21.5	6.2	0.23	5.73	Not visible	0.02	0.89	81.0			29.0			<2.0	0.000	0.013	<0.005	0.197	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW02-Corindi Ck - US		Water quality good. Moderate tannin stain	7/06/2016	21.4	5.9	0.16	6.02	Not visible	0.03	0.80	38.0	5.40	4.40	20.0	7.90	9.10	3	0.000	0.010	0.006	0.016	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW02-Corindi Ck - DS		Water quality good. Moderate tannin stain	7/06/2016	22.7	5.7	0.10	9.89	Not visible	<0.01	0.38	51.0			11.0			2	0.000	0.005	<0.005	0.033	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW03-Blackadder Gully		Clear. No flow. Bubbles on surface.	7/06/2016	22.8	5.7	0.10	9.73	Not visible	0.01	0.26	27.0	41.40	79.80	12.0	111.80	137.90	3	0.013	<0.005	<0.005	0.058	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW04-Casson's Ck - US		Moderate turb. Moderate flow.	7/06/2016	21.5	6.1	0.14	6.24	Not visible	0.02	0.56	35.0	13.80	6.40	21.0	15.70	28.20	<2.0	0.000	0.006	<0.005	0.016	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW04-Casson's Ck - DS		Water quality good. Basin discharging upstream.	7/06/2016	19.1	6.0	0.17	5.63	Not visible	0.02	0.90	30.0			17.0			<2.0	0.000	0.006	0.006	0.093	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW05-Redbank Ck - US		Low turb. No flow. Tannin stain present.	7/06/2016	20.1	5.8	0.19	5.74	Not visible	0.01	0.60	37.0	29.20	63.80	23.0	41.30	167.00	<2.0	0.000	0.005	<0.005	0.018	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW05-Redbank Ck - DS		High turb. No flow.	7/06/2016	19.5	6.1	0.18	8.35	Not visible	0.01	0.61	105.0			43.0			3	0.000	0.006	<0.005	0.069	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW06-Dirty Ck - US		Clear. Moderate trickle	7/06/2016	19.8	6.0	0.28	8.63	Not visible	<0.01	4.76	29.0	n/a	4.00	5.0	n/a	11.00	18	0.000	0.005	<0.005	0.014	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW06-Dirty Ck - DS		Clear. Moderate trickle. Smashed amber sample bottle.	7/06/2016	21.1	5.9	0.31	7.70	Not visible	<0.01	3.79	32.0			6.0			<2.0	2.070	<0.005	<0.005	0.109	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW06-Dirty Ck - DSB (Boundary)		Water quality good.	7/06/2016	20.9	6.2	0.36	7.11	Not visible	<0.01	0.17	27.0	n/a	n/a	5.0	n/a	n/a	2	0.043	<0.005	<0.005	0.012	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW07-Dundoo Ck - US		No flow. Tannin stain. Low turb.	7/06/2016	17.3	6.3	0.24	10.39	Not visible	0.02	0.52	58.0	n/a	19.00	14.0	n/a	45.90	5	<0.005	0.007	<0.005	0.013	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW07-Dundoo Ck - DS		No flow. Low turb.	7/06/2016	17.7	6.3	0.33	5.48	Not visible	<0.01	0.43	80.0			19.0			3	0.005	<0.005	<0.005	0.066	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW08-Boney's Ck - US		High turb. Moderate flow.	7/06/2016	16.1	6.0	0.29	6.92	Not visible	<0.01	0.47	105.0	12.40	68.00	23.0	13.60	124.20	<2.0	0.156	<0.005	<0.005	0.096	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW08-Boney's Ck - DS		High turb. Moderate flow.	7/06/2016	15.8	6.8	0.25	7.91	Not visible	0.01	0.60	199.0			42.0			<2.0	0.000	0.006	<0.005	0.021	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW09 Blank (Arrawarra Gully -DS)			7/06/2016						0.02	0.77	87.0			32.0	n/a	n/a	<2.0	0.000	0.006	<0.005	0.136	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW01-Arrawarra Gully - US	July Dry	Sheen	7/07/2016	11.3	5.9	0.31	5.20	Visible	0.06	0.68	242.0	19.00	21.00	135.0	20.40	71.80	<2.0	0.166	<0.005	<0.005	0.081	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW01-Arrawarra Gully - DS		Algae with lillies present	7/07/2016	13.8	6.8	0.24	3.90	Not visible	0.02	0.79	4.5			15.0			<2.0	0.409	0.010	<0.005	0.029	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW02-Corindi Ck - US		amber colour	7/07/2016	15.0	6.1	0.26	2.60	Not visible	0.04	0.33	9.0	5.40	4.40	14.0	7.90	9.10	<2.0	0.070	0.006	<0.005	0.013	<1	1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW02-Corindi Ck - DS			7/07/2016	14.6	6.4	0.13	5.70	Not visible	0.03	0.07	2.5			12.0			<2.0	0.026	<0.005	<0.005	0.019	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW03-Blackadder Gully		Dry										41.40	79.80		111.80	137.90																			
SW04-Casson's Ck - US			7/07/2016	14.6	6.3	0.26	4.10	Not visible	0.04	0.64	14.5	13.80	6.40	10.0	15.70	28.20	<2.0	0.022	<0.005	<0.005	0.074	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW04-Casson's Ck - DS		Floating debris	7/07/2016	14.7	6.2	0.21	4.20	Not visible	0.03	0.67	4.0			16.0			3	0.050	<0.005	<0.005	0.089	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW05-Redbank Ck - US			7/07/2016	16.6	6.5	0.10	5.30	Not visible	0.03	0.33	31.0	29.20	63.80	40.0	41.30	167.00	<2.0	0.123	<0.005	<0.005	0.010	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW05-Redbank Ck - DS			7/07/2016	15.4	6.3	0.26	5.00	Not visible	0.02	0.15	11.0			30.0			<2.0	0.136	<0.005	<0.005	0.009	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW06-Dirty Ck - US		Clear	7/07/2016	21.5	6.1	0.63	5.60	Not visible	0.02	0.05	1.0	n/a	4.00	3.0	n/a	11.00	<2.0	0.010	<0.005	<0.005	0.009	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW06-Dirty Ck - DS		Lab sample taken	7/07/2016					Not visible	0.02	0.12	11.0			23.0			<2.0	0.035	<0.005	<0.005	0.081	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW06-Dirty Ck - DSB (Boundary)			7/07/2016	15.9	7.2	0.34	4.70	Not visible	0.04	0.09	20.0	n/a	n/a	40.0	n/a	n/a	3	0.008	<0.005	<0.005	0.013	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW07-Dundoo Ck - US			7/07/2016	12.6	6.8	0.18	3.80	Not visible	0.02	0.10	9.0	n/a	19.00	23.0	n/a	45.90	2	0.054	<0.005	<0.005	0.038	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW07-Dundoo Ck - DS			7/07/2016	14.3	6.5	0.23	1.70	Not visible	0.04	0.30	11.5			34.0			3	0.125	<0.005	<0.005	0.019	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW08-Boney's Ck - US			7/07/2016	16.4	6.3	0.18	4.20	Not visible	0.03	0.97	16.0	12.40	68.00	36.0	13.60	124.20	<2.0	0.963	0.007	<0.005	<0.005	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW08-Boney's Ck - DS			7/07/2016	13.5	6.4	0.30	4.60	Not visible	0.03	0.65	27.5			50.0			<2.0	0.511	0.008	<0.005	0.030	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW09 Blank (Arrawarra Gully -DS)																																			
SW01-Arrawarra Gully - US	August - Wet (Samples collected 30hrs post rain) 5-day Rainfall depth value exceeded (All Stations)	Floating debris - Running	8/08/2016	18.1	6.5	0.39	5.99	Not visible	0.02	1.12	18.0	19.00	21.00	35.0	20.40	71.80	3																		
SW01-Arrawarra Gully - DS		Creek running. WQ OK.	8/08/2016	18.0	7.5	0.27	6.05	Not visible	0.03	1.27	29.0			47.0			3																		
SW02-Corindi Ck - US		Slight turb. Moderate flow.	8/08/2016	15.4	6.0	0.26	5.75	Not visible	0.07	0.78	19.0	5.40	4.40	21.0	7.90	9.10	5																		
SW02-Corindi Ck - DS		Slight turb. Moderate flow.	8/08/2016	15.1	6.3	0.14	9.80	Not visible	0.03	0.40	7.0			17.0			2																		
SW03-Blackadder Gully		Standing water. Slight tannin stain. Organic material floating.	8/08/2016	15.9	5.6	0.10	7.44	Not visible	0.03	0.24	7.0	41.40	79.80	8.8	111.80	137.90	4																		
SW04-Casson's Ck - US		Low turb. Tannin stain	8/08/2016	15.6	5.4	0.23	5.29	Not visible	0.04	0.78	4.0	13.80	6.40	13.0	15.70	28.20	3																		
SW04-Casson's Ck - DS		Low turb. Tannin stain	8/08/2016	16.3	5.9	0.27	5.54	Not visible	0.04	0.84	6.0			17.0			2																		
SW05-Redbank Ck - US		Tannin stain. Moderate flow	8/08/2016	16.0	5.4	0.19	5.64	Not visible	0.03	0.55	16.0	29.20	63.80	25.0	41.30	167.00	3																		
SW05-Redbank Ck - DS		Tannin stain. Moderate flow	8/08/2016	17.3	6.2	0.22	6.14	Not visible	0.03	0.56	15.0			26.0			3																		
SW06-Dirty Ck - US		Slight trickle. Clear	8/08/2016	16.4	6.3	0.31	8.20	Not visible	0.01	0.75	4.0	n/a	4.00	8.9	n/a	11.00	5																		
SW06-Dirty Ck - DS		Slight trickle. Clear	8/08/2016	15.7	5.8	0.36	6.97	Not visible	0.02	0.57	8.0			9.5			3																		
SW06-Dirty Ck - DSB (Boundary)		Slight Turb. Still flowing	8/08/2016	16.7	6.7	0.34	5.21	Not visible	0.02	1.87	38.0	n/a	n/a	43.0	n/a	n/a	2																		
SW07-Dundoo Ck - US		Pools and riffles. WQ OK	8/08/2016	13.5	6.4	0.27	11.27	Not visible	0.01	0.50	14.0	n/a	19.00	32.0	n/a	45.90	4																		
SW07-Dundoo Ck - DS		Pools and riffles. WQ OK	8/08/2016	17.2	6.7	0.32	6.49	Not visible	0.01	0.31	22.0			56.0			6																		
SW08-Boney's Ck - US		Motorbikes observed immediately upstram	8/08/2016	14.4	6.2	0.32	10.01	Not visible	0.01	0.34	16.0	12.40	68.00	44.0	13.60	124.20	1																		
SW08-Boney's Ck - DS		Running Creek	8/08/2016	14.5	6.3	0.32	8.61	Not visible	0.01	0.39	21.0			48.0			4																		
SW01-Arrawarra Gully - US	August - Wet	Slight turb. Floating organic matter	25/08/2016	14.7	6.1	0.39	6.24	Not visible	0.23	0.57	10.0	19.00	21.00	40.0	20.40	71.80	3	0.129	<0.005	0.144	0.044	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW01-Arrawarra Gully - DS		Slight turb. Floating organic matter	25/08/2016	16.7	7.2	0.47	5.89	Not visible	0.05	1.33	12.0			37.0			3	0.830	0.015	0.014	0.085	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW02-Corindi Ck - US		Slight tannin stain. WQ Good	25/08/2016	16.7	6.4	0.26	6.23	Not visible	0.26	0.18	4.0	5.40	4.40	16.0	7.90	9.10	10	<0.005	<0.005	0.079	<0.005	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW02-Corindi Ck - DS		Slight tannin stain. WQ Good	25/08/2016	15.7	6.7	0.17	7.48	Not visible	0.03	0.15	2.0			8.5			3	0.008	<0.005	0.010	0.033	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW03-Blackadder Gully		Tannin Stain. Floating organic matter	25/08/2016	23.7	6.5	0.10	9.06	Not visible	0.06	0.42	6.0	41.40	79.80	15.0	111.80	137.90	13	<0.005	<0.005	0.008	0.023	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW04-Casson's Ck - US		Slight tannin stain. WQ Good	25/08/2016	15.9	5.8	0.42	9.68	Not visible	0.05	0.58	2.0	13.80	6.40	9.7	15.70	28.20	9	<0.005	<0.005	0.010	0.014	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW04-Casson's Ck - DS		Moderate turb.	25/08/2016	16.0	6.4	0.52	6.80	Not visible	0.24	2.31	11.0			35.0			7	1.880	<0.005	0.139	0.044	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW05-Redbank Ck - US		Moderate Tannin stain. Low turb	25/08/2016	18.1	5.7	0.22	5.88	Not visible	0.47	0.43	4.0	29.20	63.80	38.0	41.30	167.00	6	<0.005	<0.005	0.010	0.032	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW05-Redbank Ck - DS		Moderate turb	25/08/2016	16.6	6.5	0.27	6.09	Not visible	0.06	1.19	13.0			72.0			7	0.521	0.007	0.008	0.072	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW06-Dirty Ck - US		Clear trickle	25/08/2016	16.9	6.2	0.37	8.78	Not visible	0.28	0.42	2.0	n/a	4.00	4.8	n/a	11.00	<2	0.366	<0.005	0.074	<0.005	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW06-Dirty Ck - DS		Clear trickle	25/08/2016	17.1	6.6	0.42	8.38	Not visible	0.02	0.43	2.0			8.6			7	0.330	<0.005	0.012	0.071	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW06-Dirty Ck - DSB (Boundary)		Trickle. Slight turb	25/08/2016	15.7	6.1	0.45	7.44	Not visible	0.04	0.18	10.0	n/a	n/a	29.0	n/a	n/a	<2	0.090	<0.005	0.008	0.027	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW07-Dundoo Ck - US		Slight tannin. WQ good	25/08/2016	17.3	6.0	0.27	4.55	Not visible	0.05	0.45	5.0	n/a	19.00	28.0	n/a	45.90	5	<0.005	<0.005	0.009	0.033	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW07-Dundoo Ck - DS		Moderate turb.	25/08/2016	18.9	6.1	0.46	6.25	Not visible	0.07	0.29	14.0			80.0			<2	<0.005	<0.005	0.008	0.047	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW08-Boney's Ck - US		High turb	25/08/2016	17.8	6.1	0.42	6.88	Not visible	0.21	0.44	19.0	12.40	68.00	79.0	13.60	124.20	<2	0.292	<0.005	0.065	0.046	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW08-Boney's Ck - DS		High turb	25/08/2016	16.4	6.6	0.41	8.25	Not visible	0.08	0.46	26.0			99.0			4	0.245	<0.005	0.009	0.055	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW01-Arrawarra Gully - US	August - Dry	WQ Good. Floating Debris	31/08/2016	16.0	6.0	0.41	7.38	Not visible	0.04	0.53	9.0	19.00	21.00	27.0	20.40	71.80	3																		
SW01-Arrawarra Gully - DS		Slight Cloudiness.	31/08/2016	15.6	7.6	0.59	6.01	Not visible	0.07	1.48	21.0			35.0			3																		
SW02-Corindi Ck - US		Slight Tannin Stain. Clear	31/08/2016	17.2	6.9	0.22	6.39	Not visible	Bottle smashed	Bottle smashed	2.0	5.40	4.40	8.1	7.90	9.10	Bottle smashed																		
SW02-Corindi Ck - DS		Slight Tannin Stain. Clear	31/08/2016	16.9	6.8	0.16	6.89	Not visible	0.08	0.22	2.0			8.7			4																		
SW03-Blackadder Gully			31/08/2016	19.8	6.5	0.11	9.90	Not visible	0.11	0.51	13.0	41.40	79.80	21.0	111.80	137.90	6																		
SW04-Casson's Ck - US		Clear	31/08/2016	16.9	5.9	0.43	5.54	Not visible	0.02	0.52	2.0	13.80	6.40	7.4	15.70	28.20	<2																		
SW04-Casson's Ck - DS		Clear	31/08/2016	16.4	6.2	0.39	6.61	Not visible	0.18	0.75	4.0			13.0			4																		
SW05-Redbank Ck - US		Slight Cloudiness.	31/08/2016	17.4	5.7	0.21	5.48	Not visible	0.05	0.46	4.0	29.20	63.80	41.0	41.30	167.00	<2																		
SW05-Redbank Ck - DS		Cloudy. Basins previously dewatered US	31/08/2016	16.7	6.5	0.28	5.14	Not visible	0.06	0.97	8.0			64.0			<2																		
SW06-Dirty Ck - US		Clear	31/08/2016	17.2	6.2	0.36	8.70	Not visible	0.02	0.38	2.0	n/a	4.00	3.1	n/a	11.00	7																		
SW06-Dirty Ck - DS		Clear	31/08/2016	16.5	5.9	0.38	7.70	Not visible	0.02	0.39	2.0			3.1			4																		
SW06-Dirty Ck - DSB (Boundary)			31/08/2016	16.8	6.5	0.44	6.56	Not visible	0.05	0.69	3.0	n/a	n/a	9.2	n/a	n/a	4																		
SW07-Dundoo Ck - US			31/08/2016	17.3	6.3	0.27	4.84	Not visible	0.08	0.46	4.0	n/a	19.00	22.0	n/a	45.90	<2																		
SW07-Dundoo Ck - DS		Moderate turb	31/08/2016	16.4	5.9	0.54	7.07	Not visible	0.04	0.19	11.0			44.0			5																		
SW08-Boney's Ck - US		Moderate turb	31/08/2016	17.1	6.0	0.47	6.85	Not visible	0.04	0.91	13.0	12.40	68.00	42.0	13.60	124.20	6																		
SW08-Boney's Ck - DS		Moderate turb	31/08/2016	16.0	6.5	0.44	7.26	Not visible	0.04	0.46	23.0			77.0			9																		
SW01-Arrawarra Gully - US	September - Wet	Macrophytes, birds and waterhens. Looking healthy	12/09/2016	18.7	6.2	0.40	9.0	Not visible	0.06	0.63	9.0	19.00	21.00	11.0	20.40	71.80	5																		
SW01-Arrawarra Gully - DS		As above	12/09/2016	18.6	6.9	0.48	6.7	Not visible	0.08	0.90	16.0			8.1			3																		
SW02-Corindi Ck - US		Clear. Slight Tannin	12/09/2016	22.3	6.5	0.33	4.3	Not visible	0.03	0.62	8.0	5.40	4.40	10.0	7.90	9.10	6																		
SW02-Corindi Ck - DS		As above	12/09/2016	21.8	6.9	0.18	5.6	Not visible	0.05	0.16	6.0			7.2			4																		
SW03-Blackadder Gully		WQ good	12/09/2016	22.8	5.7	0.10	9.7	Not visible	0.03	0.24	10.0	41.40	79.80	12.0	111.80	137.90	4																		
SW04-Casson's Ck - US		Clear. Slight Tannin	12/09/2016	22.6	6.2	0.53	5.5	Not visible	0.07	0.51	6.0	13.80	6.40	17.0	15.70	28.20	4																		
SW04-Casson's Ck - DS		As above	12/09/2016	21.9	6.5	0.47	7.1	Not visible	0.06	0.56	5.0			6.7			11																		
SW05-Redbank Ck - US		Orgainic sheen on surface	12/09/2016	24.1	6.0	0.23	9.5	Not visible	0.08	0.47	16.0	29.20	63.80	57.0	41.30	167.00	5																		
SW05-Redbank Ck - DS		Basins discharging U/S	12/09/2016	22.9	7.6	0.76	6.3	Not visible	0.07	2.12	24.0			33.0			<2																		
SW06-Dirty Ck - US		Clear	12/09/2016	18.0	6.8	0.36	8.7	Not visible	0.15	1.11	4.0	n/a	4.00	7.9	n/a	11.00	8																		
SW06-Dirty Ck - DS		Clear	12/09/2016	18.1	6.8	0.44	9.1	Not visible	0.08	1.14	5.0			8.6			5																		
SW06-Dirty Ck - DSB (Boundary)		Algae	12/09/2016	18.5	6.5	0.39	5.6	Not visible	0.03	0.19	19.0	n/a	n/a	42.0	n/a	n/a	5																		
SW07-Dundoo Ck - US			12/09/2016	18.7	6.4	0.29	5.3	Not visible	0.07	0.81	31.0	n/a	19.00	56.0	n/a	45.90	2																		
SW07-Dundoo Ck - DS		Brown Algae. Basin discharging	12/09/2016	18.8	6.4	0.43	4.8	Not visible	0.10	0.39	43.0			100.0			<2																		
SW08-Boney's Ck - US		Creek running.	12/09/2016	18.8	6.2	0.31	5.8	Not visible	0.09	0.47	111.0	12.40	68.00	200.0	13.60	124.20	5																		
SW08-Boney's Ck - DS		Creek running.	12/09/2016	18.8	6.6	0.42	6.7	Not visible	0.04	0.55	45.0			89.0			2																		
SW01-Arrawarra Gully - US	September - Dry	WQ Good	28/09/2016	21.8	7.2	0.52	5.4	Not visible	0.03	0.73	15.0	19.00	21.00	6.3	20.40	71.80	4	0.010	<0.005	0.006	0.040	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW01-Arrawarra Gully - DS		WQ Good	28/09/2016	21.2	7.8	0.99	8.2	Not visible	0.02	1.41	10.0			6.2			<2	0.884	0.016	0.006	0.022	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW02-Corindi Ck - US		WQ Good	28/09/2016	20.8	7.5	0.19	5.4	Not visible	0.04	0.19	3.0	5.40	4.40	5.8	7.90	9.10	4	0.014	0.009	0.012	0.019	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW02-Corindi Ck - DS		WQ Good	28/09/2016	21.0	7.1	0.17	8.4	Not visible	0.04	0.20	5.0			5.7			<2	0.015	0.007	0.011	0.025	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW03-Blackadder Gully		DRY	28/09/2016									41.40	79.80		111.80	137.90																			
SW04-Casson's Ck - US		DRY	28/09/2016									13.80	6.40		15.70	28.20																			
SW04-Casson's Ck - DS		DRY	28/09/2016																																
SW05-Redbank Ck - US		Dark pool	28/09/2016	21.0	6.3	0.24	8.6	Not visible	0.04	0.63	12.0	29.20	63.80	55.0	41.30	167.00	4	<0.005	0.018	0.011	0.046	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100

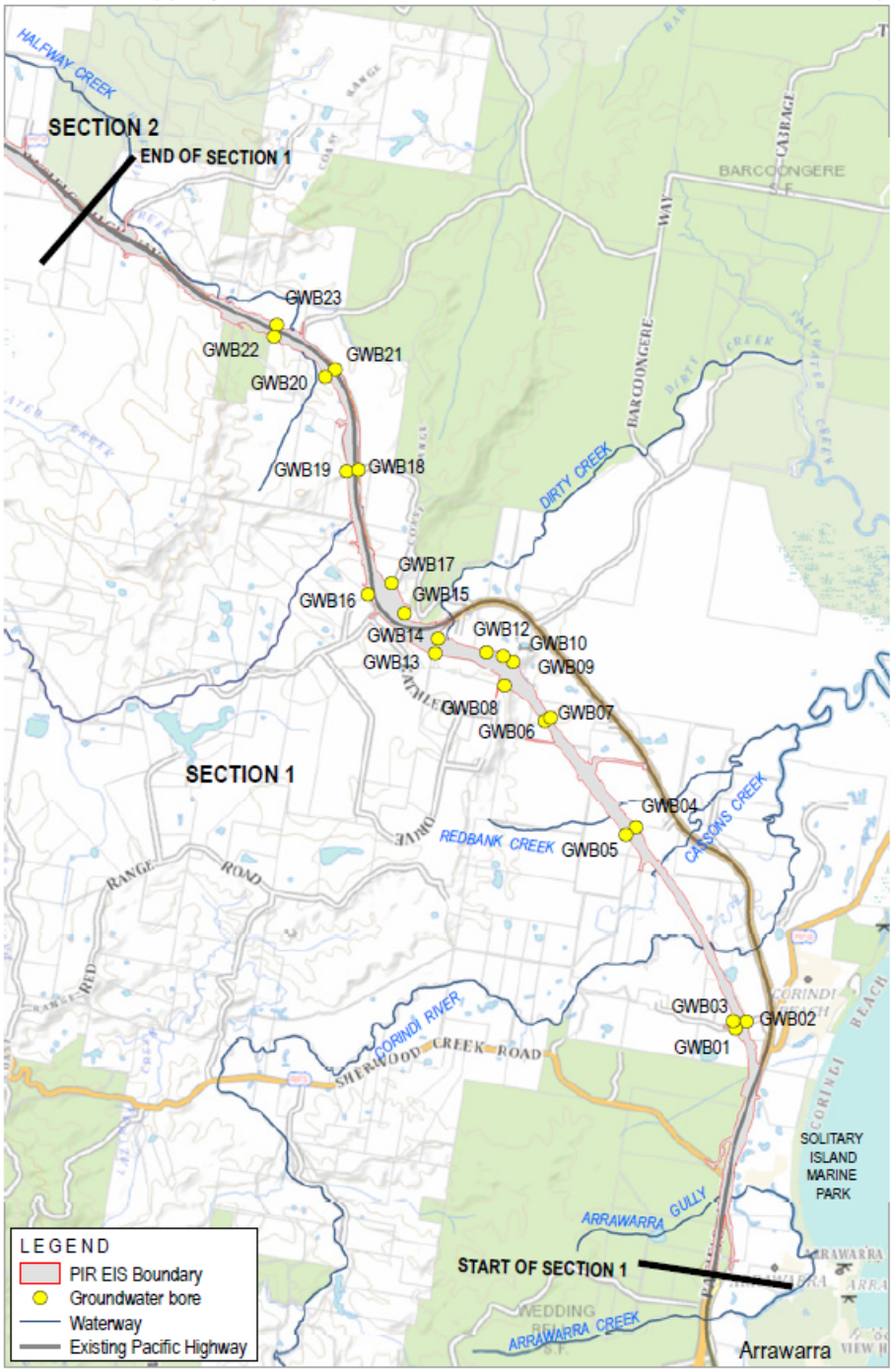
YORK

Monthly Background Surface Water Monitoring (Local Creeks)

Sampling Location	Month Sampled	Comments/Field Observations	Date Sampled	General Monthly Suite													Total Oil and Grease	Nutrients - Dissolved				BTEX						Total Recoverable Hydrocarbons (TRH)								
				Temp	pH	Conductivity mS/cm	Dissolved Oxygen mg/L	Oil and grease-VISIBLE	Total Phosphorus	Total Nitrogen	TSS	TSS Dry P80	TSS Wet P80	Turbidity (lab)	Turbidity (lab) Dry P80	Turbidity (lab) Wet P80		Nitrate	Nitrite	Phosphate	Ammonium	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	Naphthalene	C6-C9	C10-C14	C15-C28	C29-C36	C10-C16	C10-C16 less Naphthalene	C16-C34	C34-C40
				°C	pH	mS/cm	mg/L					mg/L	mg/L				mg/L	mg/L				(µg/L or ppb)						(µg/L or ppb)							
SW05-Redbank Ck - DS	September - Dry	WQ Good	28/09/2016	20.2	6.9	0.53	5.0	Not visible	0.05	0.42	7.0	29.20	63.80	8.2	41.30	167.00	3	0.028	0.006	0.006	0.007	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW06-Dirty Ck - US		DRY	28/09/2016																															
SW06-Dirty Ck - DS		DRY	28/09/2016									n/a	4.00		n/a	11.00																		
SW06-Dirty Ck - DSB (Boundary)		WQ Good	28/09/2016	20.5	7.1	0.39	9.6	Not visible	0.02	0.15	7.0	n/a	n/a	9.2	n/a	n/a	4	0.009	0.005	0.008	0.010	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW07-Dundoo Ck - US		DRY	28/09/2016									n/a	19.00		n/a	45.90																		
SW07-Dundoo Ck - DS		Modrate turb. Sitting water	28/09/2016	23.9	7.5	0.39	8.1	Not visible	0.03	0.33	43.0			59.0			3	0.010	<0.005	0.005	0.015	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW08-Boney's Ck - US		Moderate turb.	28/09/2016	22.6	7.4	0.43	8.6	Not visible	0.03	0.37	11.0			47.0			4	0.017	0.007	0.008	0.009	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW08-Boney's Ck - DS		WQ Good	28/09/2016	19.6	6.9	0.41	7.2	Not visible	0.03	0.32	14.0	12.40	68.00	26.0	13.60	124.20	3	0.056	<0.005	0.009	0.011	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW01-Arrawarra Gully - US	October Dry	WQ Good	31/10/2016	25.6	7.2	2.24	13.3	Not visible	0.04	1.13	5.0			5.3			3																	
SW01-Arrawarra Gully - DS		WQ Good	31/10/2016	20.9	7.4	0.56	14.9	Not visible	0.02	0.58	6.0	19.00	21.00	2.6	20.40	71.80	2																	
SW02-Corindi Ck - US		WQ Good	31/10/2016	23.8	7.1	0.36	9.9	Not visible	0.04	0.25	9.0			6.2			<2																	
SW02-Corindi Ck - DS		WQ Good	31/10/2016	22.9	6.8	0.19	3.9	Not visible	0.04	0.26	7.0	5.40	4.40	5.8	7.90	9.10	3																	
SW03-Blackadder Gully		Dry	31/10/2016									41.40	79.80		111.80	137.90																	
SW04-Casson's Ck - US		Dry	31/10/2016									13.80	6.40		15.70	28.20																	
SW04-Casson's Ck - DS		Dry	31/10/2016																														
SW05-Redbank Ck - US		Dry	31/10/2016																														
SW05-Redbank Ck - DS		WQ Good	31/10/2016	24.1	7.3	0.73	15.1	Not visible	0.02	0.71	4.0	29.20	63.80	4.9	41.30	167.00	<2																	
SW06-Dirty Ck - US		Dry	31/10/2016																														
SW06-Dirty Ck - DS		Dry	31/10/2016									n/a	4.00		n/a	11.00																		
SW06-Dirty Ck - DSB (Boundary)		Organic Sheen	31/10/2016	22.0	7.2	0.44	6.4	Not visible	0.02	0.30	6.0	n/a	n/a	11.0	n/a	n/a	7																	
SW07-Dundoo Ck - US		Dry	31/10/2016																														
SW07-Dundoo Ck - DS		Dry	31/10/2016									n/a	19.00		n/a	45.90																		
SW08-Boney's Ck - US		Slight cloudiness	31/10/2016	22.2	7.6	0.62	16.1	Not visible	0.04	0.41	16.0			23.0			7																	
SW08-Boney's Ck - DS		WQ Good	31/10/2016	21.8	7.4	0.45	7.4	Not visible	0.02	0.32	7.0	12.40	68.00	6.8	13.60	124.20	8																	
SW01-Arrawarra Gully - US	November - Wet	WQ Good	3/11/2016	23.1	6.2	0.65	14.3	Not visible	0.05	0.54	43.0	19.00	21.00	24.0	20.40	71.80	5																	
SW01-Arrawarra Gully - DS		WQ Good	3/11/2016	24.3	6.8	0.49	8.6	Not visible	0.04	0.68	5.0			1.7			<2																	
SW02-Corindi Ck - US		Dark natural tannin stain	3/11/2016	22.7	6.7	0.21	6.2	Not visible	0.05	0.23	8.0	5.40	4.40	5.3	7.90	9.10	4																	
SW02-Corindi Ck - DS		Dark natural tannin stain	3/11/2016	22.3	6.7	0.18	7.0	Not visible	0.04	0.16	7.0			4.3			3																	
SW03-Blackadder Gully		Dry	3/11/2016									41.40	79.80		111.80	137.90																	
SW04-Casson's Ck - US		Dry	3/11/2016																														
SW04-Casson's Ck - DS		Dry	3/11/2016									13.80	6.40		15.70	28.20																	
SW05-Redbank Ck - US			3/11/2016																														
SW05-Redbank Ck - DS		WQ Good	3/11/2016	23.1	6.9	0.73	12.7	Not visible	0.02	0.90	9.0	29.20	63.80	4.3	41.30	167.00	<2																	
SW06-Dirty Ck - US		Dry	3/11/2016																														
SW06-Dirty Ck - DS		Dry	3/11/2016									n/a	4.00		n/a	11.00																	
SW06-Dirty Ck - DSB (Boundary)			3/11/2016	21.4	7.2	0.43	10.5	Not visible	0.06	0.19	6.0	n/a	n/a	7.3	n/a	n/a	5																	
SW07-Dundoo Ck - US		Dry	3/11/2016																														
SW07-Dundoo Ck - DS		Mod turb	3/11/2016	22.0	6.2	0.44	7.7	Not visible	0.15	0.82	21.0	n/a	19.00	81.0	n/a	45.90	6																	
SW08-Boney's Ck - US		Mod turb	3/11/2016	22.7	7.4	0.55	8.6	Not visible	0.07	0.82	25.0			64.0			9																	
SW08-Boney's Ck - DS		WQ Good	3/11/2016	22.5	7.5	0.44	7.8	Not visible	0.03	0.27	7.0	12.40	68.00	6.5	13.60	124.20	7																	
SW01-Arrawarra Gully - US	November - Wet	WQ Good	10/11/2016		6.0	0.65	14.8	Not visible	0.10	1.03	18.0	19.00	21.00	21.0	20.40	71.80	7	0.005	<0.005	0.009	0.031	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW01-Arrawarra Gully - DS		WQ Good	10/11/2016		7.1	0.48	14.1	Not visible	0.03	0.68	3.0			1.5			6	0.006	<0.005	0.008	0.117	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW02-Corindi Ck - US		Dark natural tannin stain	10/11/2016		6.7	0.16	14.5	Not visible	0.05	0.21	6.0			4.4			3	<0.005	0.006	0.011	0.109	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW02-Corindi Ck - DS		Dark natural tannin stain	10/11/2016		6.7	0.18	7.3	Not visible	0.05	0.17	7.0	5.40	4.40	4.7	7.90	9.10	7	<0.005	0.005	0.011	0.067	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW03-Blackadder Gully		Dry	10/11/2016									41.40	79.80		111.80	137.90																	
SW04-Casson's Ck - US		Dry	10/11/2016																														
SW04-Casson's Ck - DS		Dry	10/11/2016									13.80	6.40		15.70	28.20																	
SW05-Redbank Ck - US		Dry	10/11/2016																														
SW05-Redbank Ck - DS		WQ Good	10/11/2016		7.1	0.46	14.0	Not visible	0.02	0.36	4.0	29.20	63.80	2.4	41.30	167.00	7	0.006	<0.005	0.005	0.069	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW06-Dirty Ck - US		Dry	10/11/2016																														
SW06-Dirty Ck - DS		Dry	10/11/2016									n/a	4.00		n/a	11.00																	
SW06-Dirty Ck - DSB (Boundary)		Sheen visible	10/11/2016		7.1	0.32	15.3	Not visible	0.03	0.15	5.0	n/a	n/a	3.1	n/a	n/a	<2	<0.005	<0.005	0.009	0.066	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW07-Dundoo Ck - US		Dry	10/11/2016																														
SW07-Dundoo Ck - DS		Mod turb	10/11/2016		6.2	0.44	10.6	Not visible	0.13	0.76	22.0	n/a	19.00	84.0	n/a	45.90	6	0.034	<0.005	0.010	0.119	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW08-Boney's Ck - US		Mod turb	10/11/2016		7.6	0.56	10.5	Not visible	0.07	0.87	12.0			13.0			7	0.427	0.020	0.009	0.109	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100
SW08-Boney's Ck - DS		WQ Good	10/11/2016		7.2	0.26	14.5	Not visible	0.03	0.27	8.0	12.40	68.00	6.5	13.60	124.20	4	0.008	<0.005	0.007	0.046	<1	<1	<1	<2	<1	<1	<10	<50	<100	<100	<50	<50	<100	<100

Information shown is for illustrative purposes only

Drawn by: RE Checked by: TIM Reviewed by: TIM Date: 31/10/14
Source of base data: NSW Roads and Maritime Services and SIX Maps



0 1.4 km

Section 1 - Woolgoolga to Halfway Creek - Groundwater Bore Monitoring Sites

GeoLINK

W2G - Water Quality Monitoring Program
2134-1112

Illustration 2.3

Site Name	Chainage (approx.)	Easting	Northing	Levels	Quality
GWB01	2500	517998	6677515	✓	✓
GWB02	2520	518123	6677612	✓	✓
GWB03	2600	517972	6677612	✓	
GWB04	5300	516634	6679934	✓	
GWB05	5320	516758	6680030	✓	
GWB06	7050	515618	6681360	✓	
GWB07	7050	515689	6681402	✓	
GWB08	7750	515113	6681805	✓	✓
GWB09	7860	515223	6682099	✓	✓
GWB10	8040	515097	6682170	✓	
GWB12	8200	514893	6682218	✓	✓
GWB13	8780	514251	6682205	✓	
GWB14	8800	514284	6682387	✓	
GWB15	9400	513868	6682705	✓	
GWB16	9820	513411	6682939	✓	✓
GWB17	9820	513706	6683082	✓	✓
GWB18	11350	513290	6684498	✓	✓
GWB19	11400	513142	6684480	✓	✓
GWB20	12640	512877	6685655	✓	
GWB21	12650	513000	6685756	✓	
GWB22	13500	512237	6686159	✓	✓
GWB23	13540	512274	6686311	✓	✓

	Sampling Time and Dip Readings						Field Analysis					Laboratory Analysis																
Site	Date	Time:	Wet/Dry:	Standpipe - Depth to Top of water (m)	Standpipe - Depth to bottom of pipe (m)	Hobo Readings Downloaded (Y/N)	pH	Temperature - (°C)	Electrical conductivity - (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (ntu)	Total Dissolved Solids (mg/L)	Total Petroleum Hydrocarbons - (µg/L)	Total phosphorus - (mg/L P)	Total nitrogen - (mg/L N)	SODIUM (mg/L)	POTASSIUM (mg/L)	CALCIUM (mg/L)	MAGNESIUM (mg/L)	CHLORIDE (mg/L)	SULFUR (mg/L)	BICARBONATE (ALKALINITY) (mg/L CaCO3 equivalent)	ALUMINIUM (mg/L)	CADMIUM (mg/L)	COPPER (mg/L)	LEAD (mg/L)	ZINC (mg/L)
GWB01	10/09/2015	10:17	N/A			Y	5.7	20.6	1.5	8.8	169	1230	<10	0.190	1.54	256	2.9	11.8	37.4	457	12	45	0.248	0.002	0.02	0.001	2.071
GWB01	16/12/2015	9:18	N/A			Y	6.0	22.7	7.55	4.3	237	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB01	19/05/2016	8:15	N/A	14.3	16.6	Y	No samples taken - bailer jammed at bottom of well.					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB01	18/08/2016	7:59	N/A			Y	4.0	10.5	4.55	12.6	0.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB01	13/12/2016	10:20	N/A	14.0	14.35**	Y	No samples taken - bailer jammed at bottom of well.					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
-					** to top of bailer																						
GWB02	10/09/2015	10:27	N/A			Y	4.1	19.0	7.48	3.0	50.6	5367	not detected	0.080	0.36	1406	8.8	18.6	162	2451	17	8	0.704	0.002	0.404	0.011	1.718
GWB02	16/12/2015	9:28	N/A			Y	5.1	21.5	8.34	3.1	53.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB02	19/05/2016	12:17	N/A	6.8	14.6	Y	5.0	22.7	7.30	9.4	48.5	4880	not detected	0.090	0.15	1258	10	14	156	2378	23	<1	1.425	0.001	0.133	0.009	0.647
GWB02	18/08/2016	8:17	N/A	7.1	14.8	Y	4.61	18.47	7.77	8.18	98.7	5010	not detected	0.197	0.244	1239	8	16	154	2460	30	6	1.304	0.001	0.316	0.014	0.863
GWB02	14/12/2016	7:38	N/A	6.65	14.5	Y	6.2	21.95	5.99	9.15	72.4	4880	not detected	0.17	0.24	1375	11	17	172	2557	26.2	3	1.685	0.002	0.408	0.025	0.975
GWB03	18/08/2016	13:05	N/A	9.4	17.7	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB03	13/12/2016	9:45	N/A	9.0	---	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB04	18/08/2016	08:50	N/A	6.3	12.5	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB04	14/12/2016	12:00	N/A	6.5	12.5	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB05	18/08/2016	14:25	N/A	7.5	12.6	N*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB05	14/12/2016	13:32	N/A	8.2	12.4	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-						* Wire broken. Hobo missing. New Hobo installed																						
GWB06	18/08/2016	08:30	N/A	10.5	10.6	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB06	14/12/2016	13:21	N/A			Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB07	18/08/2016	08:40	N/A	8.4	10.6	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB07	14/12/2016	13:17	N/A	10.1	10.5	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB08	10/09/2015	11:42	N/A			Y	6.4	20.1	0.47	3.0	108	330	610	0.220	2.63	50	1.7	31.5	5.1	80	1	84	0.148	0.001	0.099	0.004	0.382
GWB08	16/12/2015	10:56	N/A			Y	7.7	21.9	0.49	2.6	13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB08	19/05/2016	13:28	N/A	17.5	46.7	Y	6.7	22.8	0.25	8.7	31	325	69	0.07	0.39	58	3	15	13	94	2	84	0.002	<0.001	<0.001	<0.001	0.063
GWB08	18/08/2016	9:48	N/A	7.6	46.5	Y	6.6	20.2	0.52	9.3	87	330	430	0.224	0.528	68	3	15	14	120	3	80	0.002	<0.001	<0.001	<0.001	0.15
GWB08	14/12/2016	11:40	N/A	17.47	46.5	Y	6.7	21.8	0.55	8.5	35	347	not detected	0.19	0.47	63	11	11	14	113	1.8	65	0.012	<0.001	0.002	<0.001	0.103
GWB09	10/09/2015	11:09	N/A			Y	5.7	20.1	0.88	2.1	401	530	not detected	0.150	0.39	105	4.7	6.3	19.2	188	6	80	0.211	0.001	0.006	<0.001	0.109
GWB09	16/12/2015	9:46	N/A			Y	6.0	21.9	1.03	8.9	11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB09	19/05/2016	12:41	N/A	13.1	21	Y	5.9	22.2	0.72	9.7	29	507	not detected	0.05	0.12	95	5	4	19	173	7	14	0.03	0.001	0.523	<0.001	0.186
GWB09	18/08/2016	9:08	N/A	13.3	20.8	Y	5.6	18.7	0.87	8.7	128	500	not detected	0.17	0.148	108	4	4	21	225	6	4	0.089	0.001	0.322	0.009	0.185
GWB09	13/12/2016	12:00	N/A	15	20.8	Y	Not enough water to sample - no recharge after purging					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB10	18/08/2016	09:15	N/A	15.6	20.4	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB10	14/12/2016	No acces	N/A	---	---	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB12	10/09/2015	---	N/A	Site not accessible			---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB12	16/12/2015	10:01	N/A			Y	6.9	22.2	0.40	3.6	0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB12	19/05/2016	9:38	N/A	14.4	15.3	Y	not enough water to get complying sample					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB12	18/08/2016	9:27	N/A	13.8	15.3	Y	5.8	19.7	0.33	9.1	392	170	not detected	0.361	0.394	43	2	10	8	66	3	50	0.022	<0.001	0.003	<0.001	0.344

GWB12	13/12/2016	12:40	N/A	14.3	15.5	Y	not enough water to get sample - no recharge					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB13	18/08/2016	01:25	N/A	17.7	20.5	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB13	14/12/2016	8:10	N/A	18	20.6	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB15	18/08/2016	12:45	N/A	11.5	13.7	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB15	14/12/2016		N/A	12.3	14	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
GWB16	10/09/2015	12:06	N/A			Y	7.4	20.7	0.974	2.9	22.4	573	not detected	0.040	0.44	194	2.4	15	9.7	135	7	270	0.09	<0.001	0.055	0.003	0.154		
GWB16	16/12/2015	10:35	N/A			Y	9.2	22.0	1.020	4.8	9.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
GWB16	19/05/2016	13:30	N/A	15.3	22.6	Y	6.8	22.1	1.270	9.8	107	727	not detected	0.08	0.2	231	3	23	17	251	16	192	0.003	<0.001	0.004	<0.001	0.048		
GWB16	18/08/2016	9:58	N/A	14.6	22.5	Y	7.05	20.92	1.46	9.36	90.2	770	not detected	0.194	0.639	273	4	28	18	349	16	166	0.003	<0.001	0.007	<0.001	0.193		
GWB16	13/12/2016	1:36	N/A	14.69	22.5	Y	6.53	22.23	1.36	8.78	123	727	not detected	0.1	0.24	239	3	27	17	315	15.3	150	0.002	<0.001	0.003	<0.001	0.089		
GWB17	10/09/2015	13:40	N/A			Y	7.12	20.43	3.22	2.87	24.1	1945	not detected	0.030	0.49	454	12.5	156	54.4	719	26	400	0.007	0.001	0.006	<0.001	0.109		
GWB17	16/12/2015	10:17	N/A			Y	8.35	21.25	3.17	3.18	94	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
GWB17	19/05/2016	11:49	N/A	14.5	23.0	Y	6.76	21.69	3.31	10.39	44	2167	not detected	0.04	0.38	431	15	177	68	759	27	448	0.004	<0.001	0.005	<0.001	0.068		
GWB17	18/08/2016	12:09	N/A	14.45	22.65	Y	7.58	19.83	2.36	9.32	64.3	2000	not detected	0.163	0.477	445	13	161	63	871	34	450	0.002	<0.001	<0.010	<0.001	0.093		
GWB17	13/12/2016	13:00	N/A	14.45	22.5	Y	7.34	22.99	1.99	8.02	104	1833	not detected	0.07	0.31	451	12	152	58	690	25.1	400	0.004	<0.001	0.004	<0.001	0.073		
GWB18	10/09/2015	---	N/A	---	---	N	Site not accessible					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB18	16/12/2015		N/A			Y						---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB18	19/05/2016	11:36	N/A	17.1	20.7	Y	6.7	22.7	1.94	9.76	286	1853	not detected	0.15	0.17	351	5	137	34	192	6	830	0.023	<0.001	0.002	0.004	0.04		
GWB18	18/08/2016	12:01	N/A	17.5	20.7	Y	7.61	20.66	0.944	9.37	362	1673	not detected	0.46	0.816	349	4	127	31	207	4	725	0.024	<0.001	0.002	0.004	0.027		
GWB18	13/12/2016	16:25	N/A	17.75	20.7	Y	7.76	23.53	0.978	8.01	437	1267	not detected	0.36	0.29	329	4	107	27	208	7.8	655	0.032	<0.001	0.001	<0.001	0.012		
GWB19	10/09/2015			15.4	15.6	Y	Dry - no sample taken					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB19	16/12/2015					Y						---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB19	19/05/2016	11:09	N/A	15.5	15.6	Y	Dry - no sample taken					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB19	18/08/2016	10:10	N/A	15.5	15.5	Y	Dry - no sample taken					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB19	13/12/2016	2:10	N/A	15.35	15.35	Y	Dry - no sample taken																						
GWB20	18/08/2016	No Access- surrounded by water.				N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB20	15/12/2016	8:24	N/A	15.3	18.6	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
GWB21	18/08/2016	12:05	N/A	18.1	18.7	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB21	14/12/2016		N/A	18.1	18.6	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWB22	10/09/2015	12:27	N/A			Y	5.1	20.3	1.80	2.4	217	1120	not detected	0.140	0.23	308	490	11.1	19.4	490	10	14	0.208	0.001	0.149	0.001	0.31		
GWB22	16/12/2015	11:17	N/A			Y	6.5	21.6	1.67	2.3	800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
GWB22	19/05/2016	13:49	N/A	8.9	12.4	Y	5.3	21.8	1.58	9.8	419	917	not detected	0.16	0.45	256	5	10	17	406	7	13	0.365	<0.001	0.218	0.002	0.247		
GWB22	18/08/2016	10:20	N/A	9.15	12.5	Y	6.6	20.8	0.47	8.4	800	300	not detected	0.594	1.23	79	2	4	3	97	4	20	0.431	<0.001	0.195	0.006	0.088		
GWB22	13/12/2016	15:45	N/A	3.9	6.8	Y	7.3	22.7	0.97	8.1	145	700	not detected	0.17	1.41	252	2	8	6	186	27.5	240	0.092	<0.001	0.007	0.004	0.059		
GWB23	10/09/2015	12:27	N/A			Y	Damaged (pipe bent) - able to get hobo readings but not samples					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB23	16/12/2015	10:15	N/A	4.1		Y	Damaged (pipe bent) - able to get hobo readings but not samples					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB23	19/05/2016	11:44	N/A	4.75	12.0	Y	Damaged (pipe bent) - able to get hobo readings but not samples					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GWB23	18/08/2016	11:45	N/A	3.3	13	Y	7.6	20.4	0.47	12.0	535	420	not detected	0.576	0.807	93	1	6	2	55	12	110	0.201	<0.001	0.015	<0.001	0.032		
GWB23	13/12/2016	16:05	N/A	4	13.35	Y	7.6	22.7	0.88	8.3	0	800	not detected	0.34	0.85	273	5	12	17	457	9.1	10	0.107	0.001	0.348	0.003	0.386		

Woolgoolga to Halfway Creek
Blast Monitoring

Cut	Shot	Date	Sensitive Receiver 1			Sensitive Reciever 2			Sensitive Reciever 3			Sensitive Reciever 4		
			Distance (m)	Vibration (mm/s)	Overpressure (dBL)	Distance (m)	Vibration (mm/s)	Overpressure (dBL)	Distance (m)	Vibration (mm/s)	Overpressure (dBL)	Distance (m)	Vibration (mm/s)	Overpressure (dBL)
8	21	24/05/2016	214	N/A	N/A	353	8.07	121.5	369	2.98	117.4	731	0	0
8	22	24/05/2016	168	N/A	N/A	238	8.07	121.5	425	2.98	117.4	592	0	0
8	23	24/05/2016	178	N/A	N/A	238	8.07	121.5	437	2.98	117.4	586	0	0
8	24	15/06/2016	141	N/A	N/A	240	11.26	124.3	370	7.07	122.2	595	2.41	113.2
8	25	5/07/2016	140	N/A	N/A	260	11.99	123.5	333	5.85	120.4	633	4.22	113
8	26	5/07/2016	214	N/A	N/A	330	11.99	123.5	426	5.85	120.4	698	4.22	113
8	27	5/07/2016	146	N/A	N/A	208	11.99	123.5	406	5.85	120.4	565	4.22	113
8	28	12/07/2016	346	N/A	N/A	489	1.07	123.8	286	2.74	122.3	847	0	0
8	29	12/07/2016	239	N/A	N/A	387	1.07	123.8	272	2.74	122.3	761	0	0
8	30	26/07/2016	162	N/A	N/A	300	4.11	118	299	4.37	120.3	677	0	0
8	31	26/07/2016	175	N/A	N/A	293	4.11	118	380	4.37	120.3	664	0	0
8	32	2/08/2016	193	N/A	N/A	260	1.64	117.1	447	1.01	113.5	608	0	0
8	33	16/08/2016	203	N/A	N/A	336	2.36	112.4	334	2.3	115	712	0	0
8	34	25/08/2016	197	N/A	N/A	312	5.12	121.4	385	3.86	122.1	680	0	0
8	35	6/09/2016	212	N/A	N/A	324	8.47	120.2	395	7.08	118.1	691	0	0
8	36	22/09/2016	202	N/A	N/A	302	1.86	119.9	428	4.48	95	660	0	0
8	37	27/09/2016	217	N/A	N/A	366	1.63	119.1	284	1.83	120.3	741	0	0
8	38	13/10/2016	183	N/A	N/A	309	0.9	113.2	337	0.66	94.8	683	0	0
8	39	21/10/2016	183	N/A	N/A	285	1.88	107.6	388	1.65	121.2	636	0	0
8	40	28/10/2016	144	N/A	N/A	258	0.57	108	344	0.67	123.9	628	0	0
8	41	4/11/2016	212	N/A	N/A	310	0.74	113.1	394	1.45	123.9	658	0	0

Notes -
Sensitive Reciever 1 - caravan was relocated post 16 February 2016 & Sensitive Reciever 4 was identified as the no limit receiver

Cut	Shot	Date	Cut 10 Reciever		Cut 10 Reciever		Cut 15 Reciever		Cut 15 Reciever		Cut 15 Reciever	
			Vibration (mm/s)	Overpressure (dBL)	Vibration (mm/s)	Overpressure (dBL)	Vibration (mm/s)	Overpressure (dBL)	Vibration (mm/s)	Overpressure (dBL)	Vibration (mm/s)	Overpressure (dBL)
15	1	20/05/2016	N/A	N/A	N/A	N/A	1.74	122.2	0.52	113.5	0.71	114.4
15	2	27/05/2016	N/A	N/A	N/A	N/A	1.97	121.3	0.48	110.1	0.59	113.8
10	2	18/10/2016	6.36	102.6	9.23	123.9	N/A	N/A	N/A	N/A	N/A	N/A