SMEC

Local People. Global Experience.

Construction Environmental Management Plan

Cobaki Estate – Southern Special Purpose Precinct (SSPP)

Bulk Earthworks

August 2016

For: LEDA Manorstead Pty Ltd

Project Name:	Cobaki Estate Development
Project Number:	30031162
Report for:	LEDA Manorstead PTY LTD

PREPARATION, REVIEW AND AUTHORISATION

Revision #	Date	Prepared by	Reviewed by	Approved for Issue by
1	12/06/2014	A Marsden	J Alexander	J Alexander
2	31/08/2016	A Marsden	J Alexander	J Alexander

ISSUE REGISTER

Distribution List	Date Issued	Number of Copies
LEDA Manorstead PTY LTD:	31/08/16	1
SMEC staff:		
Associates:		
Tweed Shire Council		
Gold Coast Office Library (SMEC office location):		
SMEC Project File:		

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1 INTRODUCTION

This Construction Environmental Management Plan (CEMP) has been prepared by SMEC Pty Ltd for LEDA Manorstead Pty Ltd for the proposed fill area located within the Southern Special Purpose Precinct (SSPP) of the Cobaki Estate development.

1.1 Location

The Cobaki Development is located west of the Tugun Bypass and Gold Coast Airport, Tweed Heads. The proposed development is bound by the Queensland and New South Wales border to the north and west and Piggabean Road to the south. The site adjoins Cobaki Creek and Cobaki Broadwater to the east. It is located approximately 6 km west of Tweed Heads/Coolangatta Town Centre and 1.5 km west of the Gold Coast Airport and the Gold Coast Highway, and 500 m west of the Pacific Motorway (Tugun Bypass). Access is currently off Piggabean Road. Future access will be off Boyd Street from the north and linking to Piggabean Road via the proposed Cobaki Parkway.

The site exists in its current state as a large portion of cleared land, which was previously cleared for agricultural purposes (cattle grazing), and scatterings of native vegetation communities.

This report specifically pertains to the infill area located in the Southern Special Purpose Precinct, herein referred to as the SSPP. The SSPP occurs in the southern section of the site and consists of land described as Lot 55 DP755740 and Lot 1 DP570076. The SSPP covers a total area of approximately 4.3ha, sharing boundaries with Cobaki Parkway and the Central Open Space.

The location of the SSPP with respect to the Cobaki site is shown in **Figure 1**.

1.2 Project Scope

LEDA Manorstead are seeking a modification application for the Cobaki Estate Central Open Space Project Approval (08_0200 Mod 3) for the excavation and placement of fill in the SSPP, including bulk earthworks. Fill is proposed to be taken from Precinct 9 to place the required 170,185m^3 of fill for the SSPP.

This report details the potential environmental impacts of the proposed earthworks and a description of environmental management, mitigation and monitoring measures to minimise these potential impacts.

Refer to Appendix A for Scope of Works and earthworks intent.

Figure 1: Site Locality

COORDINATE SYSTEM GDA 1994 MGA Zone 56	0 1 2 km Scale: 1: 40,000 @ A4	**FIGURE** 1 - Site Locality	**REVISION** 1	**STATUS** FINAL
		CREATED BY AM11482	**DATE** 12/12/2013	**ISSUED FOR INFORMATION**
PROJECT NO. 30031162	**PROJECT TITLE** Cobaki Estate Management Plans	**SOURCE** The State of Queensland (Department of Environment and Resource Management), Copyright 2010 Aerial Imagery from Nearmap Hypertiles, copyright 2011	**CLIENT** LEDA MANORSTEAD PTY LTD	**CONSULTANT** SMEC Australia

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2 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

2.1 CEMP Context

This CEMP has been prepared in accordance with Condition C4 (2) of MP06_0316: "All future applications are to include draft stage-specific CEMPs that detail measures to address the impacts of construction including, but not limited to: erosion and sediment control (in accordance with *Managing Urban Stormwater-Soils & Construction Version 4, Landcom 2004, or the latest version);* protection of fauna (generally in accordance with the Fauna Management Plan – Cobaki Lakes PPR 2009); groundwater and acid sulphate soils; and, protection of trees and vegetation to be retained (generally in accordance with the Vegetation Management Plan, Cobaki Lakes PPR 2009)". Separate CEMP's will be developed for subsequent precincts.

Stand-alone management plans have also been prepared as appropriate for various construction activities. The matters addressed by these plans have been summarised within this CEMP which provides a framework of systems and procedures to be implemented to ensure that controls are established and maintained to manage potential environmental impacts during pre-construction and construction phases of the development.

Leda Manorstead Pty Ltd will plan and implement an integrated management system for the mitigation of environmental impacts associated with the project with regular monitoring and auditing to assess their effectiveness.

2.2 CEMP Objectives

The key performance objective of this CEMP is to comply with all relevant environmental legislation and regulations, and in doing so minimise environmental impacts on the receiving environment arising from project related activities.

This CEMP describes the LEDA's environmental commitments and other legal and regulatory obligations relevant to the construction of the Project. Key environmental objectives and targets for the proposed development are shown in Table 1.

Table 1: Key Environmental Objective and Targets for the Cobaki Development

ASPECT	OBJECTIVE	TARGET
Soils & Geology	To apply soil erosion and sediment control principles to minimise soil erosion and water pollution.	• No increase in groundwater contamination resulting from construction activities • Negligible change to the existing groundwater regimes in the project area • Discharged groundwater within all specified water quality criteria
Ecology	To protect flora and fauna within and adjacent the construction area	• No loss or damage to Threatened flora species, retained Endangered Ecological Communities or significant impact on native vegetation outside of the earthworks boundaries • Minimal loss or significant impacts to native fauna,

		with no loss of endangered or threatened fauna; • Minimal loss or significant impacts to identified habitat trees and/or features; • No decrease in the diversity of the local protected fauna species population; • Adequate control/management of any introduced/invasive pest species, where identified; and • No infringements of the regulatory requirements relevant to flora and fauna.
Water Quality & Hydrology	To avoid pollution of the environment and particularly the Cobaki Broadwater, by fuels, oils, chemicals or soil stored or used on the project.	• All practical measures will be taken to prevent contaminated stormwater from adversely affecting the water quality of Cobaki Creek and Cobaki Broadwater. • Implement effective materials handling and sediment and erosion control to ensure no spills of fuel, oil, chemicals or soil into the environment. • Avoidance of pollution to SEPP 14 Coastal Wetlands and floodplain Endangered Ecological Communities.
Air Quality & Climate	To minimise potential air pollution from construction activities	Maintain effective air management practices throughout the project.
Noise & Vibration	To minimise potential impacts of noise and vibration from construction activities	Maintain effective noise and vibration management practices throughout the project.
Cultural Heritage	To minimise potential heritage impacts during construction activities	Maintain effective heritage management practices throughout the project in accordance with the site specific CHMP.
Waste	To minimise waste resulting from construction activities	Keep accurate records for all waste leaving the project. Reduce, reuse and recycle all wastes (where possible).
Traffic & Access	To minimise potential impacts on traffic during construction	Maintain effective traffic management practices throughout the Project.

2.3 Construction Activities

2.3.1 Pre-Construction Activities

The following notifications and inspections shall be carried out prior to construction works commencing:

- Adjoining and affected residents shall be provided with a minimum 72 hours' notice prior to the commencement of works;
- Tweed Shire Council (TSC), Department of Primary Industries (DPI) and the Property Council of Australia (PCA) shall be given written notice, at least 48 hours prior to the commencement of all works on the site for the project;
- The PCA is to be given a minimum of 48 hours' notice prior to any critical stage inspection or any other inspection nominated by the PCA via the notice under Section 81A of the *Environmental Planning and Assessment Act 1979*; and
- Prior to the commencement of works all erosion and sediment control measures are to be installed and operational to the satisfaction of Tweed Shire Council.

2.3.2 Construction Activities

Construction activities associated with the SSPP include:

- Site establishment including installation of exclusion fencing;
- Removal of saltmarsh and freshwater wetland communities;
- Temporary erosion, sediment and water quality control measures;
- Topsoil stripping and management;
- Drainage construction; and
- Bulk earthworks (Refer to Appendix A for Bulk earthworks drawings).

2.4 Work Hours

All construction activities including the delivery of materials to and from the site will be restricted to the hours of 7.00 am to 6.00 pm Monday to Saturday. No works shall be undertaken on Sundays or Public Holidays.

Works that may be undertaken outside these hours:

- The delivery of materials is required outside these hours by the Police or other authorities;
- It is required in an emergency to avoid the loss of life, damage to property and/or to prevent environmental harm; and
- Residents likely to be affected by the works are notified of the timing and duration of these works as soon as possible.

Rock breaking, rock hammering, sheet piling, pile driving and any similar activity shall only be carried out during the following times:

- 9.00 am to 12.00 pm Monday to Saturday; and
- 2.00 pm to 5.00 pm Monday to Saturday.

Where practical and near sensitive receptors, piling activities shall be completed using bored piles.

2.5 Plant & Equipment

Below is a list of the expected plant and equipment to be used during construction activities planned for the SSPP.

The actual type and number of construction plant and equipment items will vary throughout the construction period depending on the timing and nature of construction activities being undertaken. Proposed plant and equipment to be used during construction of the project include:

- tracked excavators
- semi-trailers for delivering materials
- dump Trucks for the movement of material associated with earthworks
- grader (for road construction and earthworks)
- water truck
- roller/compactors
- backhoe
- portable generators

- bulldozers
- mulcher

2.6 Timing & Scheduling

Timing of the commencement and progress of works will be dependent on a range of factors, including approval of Construction Certificates, availability of contractors, the proponent's business plan for the development and prevailing weather conditions. It is also possible that additional construction certificates will be approved in the near future and may be running concurrently with the already proposed works, thus making detailed scheduling at this time impractical.

Details of proposed timing of the various construction elements will be provided to TSC and other relevant agencies as soon as practical after the decision to proceed with an individual construction element is made.

2.7 Location of Site Facilities

The location of the main site facility/office is within the property boundaries of the project and is shown in Figure 2.

Given the location of Environmental Protection Areas (no-go zones) surrounding the site office, access to the site will only be made via the entrance off Piggabeen Road. These no-go zones will be appropriately demarcated and fenced as shown in Appendix B (Drawing No. 3310071E-044).

The site facility/office contains all portable buildings including offices, first aid, undercover parking, portable toilets and showers, storage containers and a workshop.

Lay down/storage areas will be constructed as all-weather access that will be cleared and grubbed; topsoil removed and stockpiled with a 150 mm layer of 20 mm aggregate laid and compacted. The lay down/storage areas will be secured with exclusion fencing.

2.7.1 Storage of Hazardous Goods

The storage of chemicals, fuels and dangerous goods will be strictly in accordance with relevant legislation, manufacturer's instructions, the MSDS and Australian Standard 1940. The designated location for on-site storage of hazardous chemicals and fuels is within, or next to, the workshop as shown in Figure 3.

Environmental and safety information on hazardous substances (e.g. MSDS) will be available at the main site office and where such substances are stored. These locations will be communicated to all personnel during the induction process.

Adequate quantities of emergency response materials such as oil/hazard spill kits, absorbent materials etc, will be readily available and kept in designated locations.

2.8 Previous Studies

A number of previous studies have been undertaken as part of the various stages of development approval for this proposed development and have been reviewed as part of this CEMP.

Such studies reviewed as part of this report include, but are not limited to:

- Flora and Fauna Monitoring Program (SMEC, 2014)
- Revised Assessment of Significance (JWA, 2013a)
- Revised Ecological Assessment (JWA, 2013b)
- Revised Regeneration and Revegetation Plan (JWA, 2012a)
- Revised Saltmarsh Rehabilitation Plan (JWA, 2012b)
- Revised Fauna Management Plan (JWA, 2010a)
- Vegetation Management Plan – Preferred Project Report (JWA, 2009)
- Construction Environmental Management Plan – Statement of Intent (Yeats, 2010).
- Stormwater Quality Concept Plan (Yeats, 2010)
- Environmental Assessment Report Part 3A Concept Plan (JBA Urban Planning, 2008)

With respect to sub-plans, Table 2 lists the sub-plans used in compiling this CEMP. Each of these sub-plans has specific management measures, monitoring and reporting requirements that must be implemented as per the various conditions of approval relating to this proposed development.

Table 2: CEMP Sub-plans

	Management Plan Title	Prepared By
1	Fauna Management Plan	SMEC
2	Vegetation Management Plan	SMEC
3	Flora and Fauna Monitoring Program	SMEC
4	Salt Marsh Rehabilitation Management Plan*	SMEC
5	Freshwater Wetland Compensatory Habitat Plan	SMEC
6	Wallum Froglet Compensatory Habitat Plan	SMEC
7	Construction Traffic and Pedestrian Management Plan	CRG
8	Noise and Vibration Management Plan	CRG
9	Cultural Heritage Management Plan	Everick Heritage Consultants
10	Erosion and Sediment Control Plan	Yeats

2.9 Consultation for Preparation of CEMP

The pre-construction and approvals stage required consultation with a number of Authorities during the preparation of this CEMP and respective Environmental Management Plans. This consultation has involved a combination of meetings and review of plans during the concept stage to teleconferences during the formation of this CEMP. The outcomes of all consultation have been incorporated into this documentation as a means of demonstrating compliance to the approval authority.

* In preparation

Figure 2: Site Compound

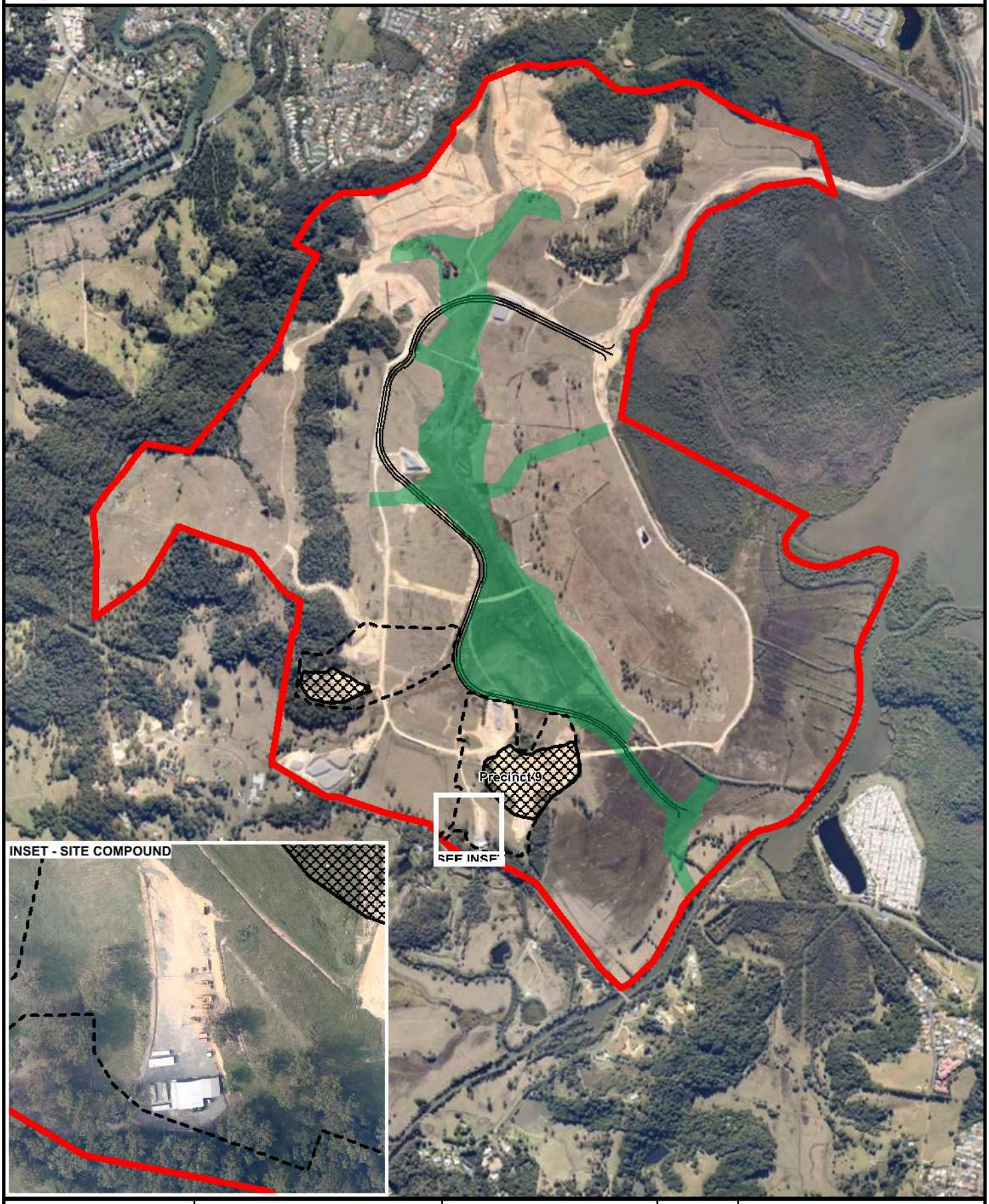

FIGURE Site Compound	PROJECT NO. 30031162	SCALE 0 400 800m Scale: 1:20,000 @ A4	N	CONSULTANT SMEC Australia
CREATED BY AM11482	PROJECT TITLE Cobaki Estate Management Plans			
REVISION 1				
STATUS FINAL	COORDINATE SYSTEM GDA 1994 MGA Zone 56			CLIENT LEDA Manorstead Pty Ltd
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Figure 3: Storage of Hazardous Goods

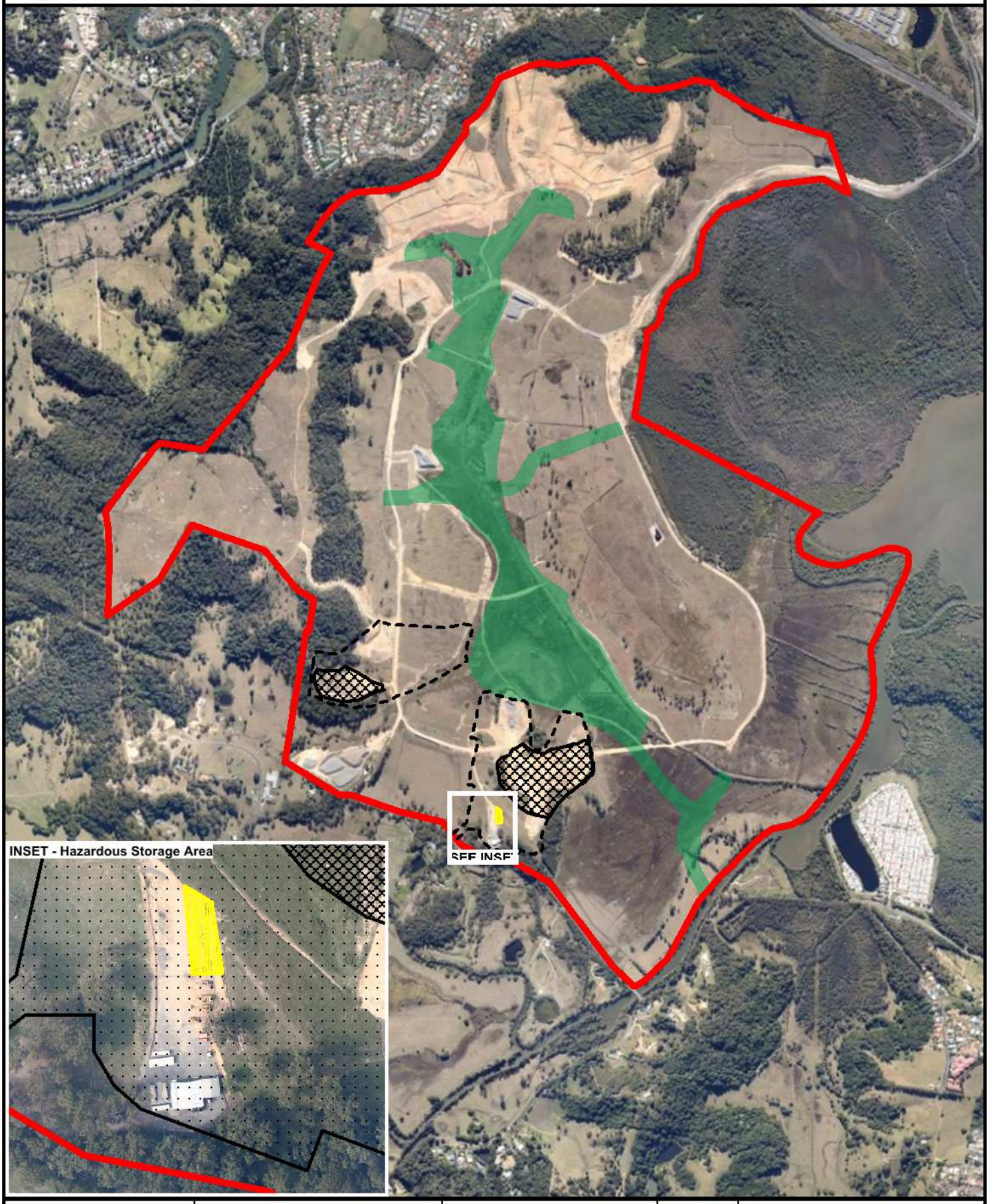

FIGURE Hazardous Goods	PROJECT NO. 30031162	SCALE 0 400 800m Scale: 1:20,000 @ A4	N	CONSULTANT SMEC Australia
CREATED BY AM11482	PROJECT TITLE Cobaki Estate Management Plans			
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3 APPROVALS & LICENSING REQUIREMENTS

3.1 Applicable Approval & Licensing Requirements

The legislative requirements, policies, guidelines and standards relevant to each sub-plan for the project are summarised in Table 3. If changes occur to legislation throughout the duration of the project, any necessary amendments to this CEMP will be communicated to the relevant staff. A copy of all relevant licences, permits, approved plans and conditions of approval will be maintained on site at all times and made available upon request by TSC, Office of Environment and Heritage (OEH) or any state agency.

Table 3: Environmental Legislation Relevant to the Project

Legislation	Details of Approvals/Permits Required	Relevance to the Project
Commonwealth		
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	The Aboriginal and Torres Strait Islander Heritage Protection Act 1984 is the principal Commonwealth legislation for the protection of areas and objects of particular significance to Indigenous Australians.	The Act applies in addition to any State requirements. Persons who discover anything that they have reasonable grounds to suspect to be Aboriginal remains are required to report their discovery to the Minister (s.20).
Native Title Act 1993	The Native Title Act (1993) was developed by the Federal Government in recognition of the outcomes of the *Mabo versus Queensland* High Court decision in 1992 which found that the common law of Australia could authorise the rights of Aboriginal and Torres Strait Islander people to lands and waters according to their laws and customs (refer HCA_{23} 1992). The Act aims to authorise and protect Aboriginal peoples' and Torres Strait Islanders' common law native title rights and interests with specifically to: ▪ provide for the recognition and protection of native title; ▪ establish ways in which future activities affecting native title may proceed; ▪ establish a mechanism for determining applications for the recognition of native title; and ▪ provide for, or permit, the validation of certain acts carried out before 1 January 1994 that were made invalid because of the existence of native	Under the Native Title Act 1993 (Cwlth), the valid grant of a freehold estate on or before 23 December 1996 is known as a 'previous exclusive possession act' (PEPA). This means that native title has been extinguished over the area in question tenured as freehold. The area over which the Cobaki Development is proposed is tenured as freehold and therefore meets the definition of a PEPA.

Legislation	Details of Approvals/Permits Required	Relevance to the Project
	title. The Act was substantially amended in 1998. The amended *Native Title Act (1993 (Cwlth))* allows for confirmation that native title rights and interests have been extinguished (removed) outright by providing a list of the kinds of acts or activities that extinguish native title rights and interests, and provides for, or permits, the validation of certain acts carried out between 1 January 1994 and 23 December 1996.	
New South Wales		
Environmental Planning and Assessment Act 1979 and Environmental Planning and Assessment Regulations 2000 (EP&A Act)	Development in NSW is regulated principally through the EP&A Act. It establishes a system of identifying development requiring consent, and the applicable assessment and approval processes. The Act makes provision for the development of Environmental Planning Instruments including State Environmental Planning Policies (SEPPs) and Local Plans.	On February 1 2007, the Director General, as delegate of the Minister of Planning, advised the applicant that the proposal for Cobaki Lakes Estate is a 'major' project to which Part 3A of the EP&A Act applies and requires the Minister's approval, and authorizes the submission of the Concept Plan.
Threatened Species Conservation Act 1995	The Threatened Species Act 1995 identifies and protects threatened and endangered species, populations and ecological communities.	As several threatened species and endangered ecological communities will be impacted by the proposed development a number of management plans have been conditioned as part of MP06_0316 and MP08_0200 to ensure the long term protection of such species/ communities.
Protection of the Environment Operations Act 1997 (POEO)	The POEO Act sets severe penalties for harming the environment, polluting waters operating equipment inefficiently and incorrectly handling waste. The NSW OEH (now OEH) administers Environment Protection Licences.	A dangerous goods licence may be required under POEO Act for the storage of flammable, toxic or corrosive substances on site.

Legislation	Details of Approvals/Permits Required	Relevance to the Project
Contaminated Land Management Act 1997	Provides for the investigation and remediation of contaminated land sites in NSW. Where contaminated material is identified, or land contamination occurs, a duty to report to the NSW OEH (OEH) applies.	A detailed Acid Sulfate Soils Management Plan and Groundwater Management Plan has been prepared under MP06_0316.and MP08_0200. However, Acid Sulfate Soils are not relevant to the proposed borrow areas as excavation involves rock at higher elevations.
Native Vegetation Act 2003	The Native Vegetation Act 2003 relates to the sustainable management and conservation of native vegetation. The objectives of this Act seek to: • encourage and promote the management of native vegetation; • prevent broadscale clearing; • protect native vegetation of high conservation value; • improve the condition of existing native vegetation; and • encourage the revegetation of land and rehabilitation of land.	Clause 5 of the Act however specifies that the Act does not apply to 'residential' zoned land under an environmental planning instrument.
Fisheries Management Act 1994	This Act addresses impacts on threatened aquatic species and habitats. Permits are required to carry out any activity that would cause damage to marine vegetation such as mangroves and seagrass, or to block waterways. Notification is required for dredging or reclamation works. Usually a variety of permits required for these types of work (e.g. Culverts, watercourse diversions) being performed in a wetland area.	As the works proposed are being conducted under an existing part 3A approval, the requirements of the *Fisheries Management Act 1994* do not apply.
Heritage Act 1977	The Heritage Act aims to serve as a legislative framework for the protection of heritage items within the State. The Act requires the NSW Heritage Council to maintain the states heritage register.	A search of the NSW Heritage Register found no sites within the footprint of the proposed works and as such referral under this Act is not required.
National Parks & Wildlife Act 1974	The NPW Act provides for the reservation and dedication of national parks, nature reserves, historic sites etc. and protection of certain native flora and fauna. It is also the principal legislation for the protection of Aboriginal objects and places of significance ("Aboriginal places").	Section 84 and 90 of the National Parks and Wildlife Act 1974 (NPW Act) provides the primary basis for the legal protection and management of Aboriginal sites and relics within NSW. The Act requires amongst other things:

Legislation	Details of Approvals/Permits Required	Relevance to the Project
	It is an office to disturb or move any Aboriginal objects without a permit (s.86). Similarly, it is an office to destroy, deface or damage an Aboriginal place or Aboriginal object without consent from the D-G NPWS (s.90).	• Consultation with the OEH prior to development to determine the existence of items of Aboriginal heritage; • Consultation with local Aboriginal groups; and • Consent to disturb Aboriginal heritage sites/items. Approval under the NPW Act is not required.
Water Act 1912	Approval is required for interception of groundwater.	Approval is required under Part 5 of the Water Act 1912 is required as the proposed works will intercept groundwater during construction.
Noxious Weeds Act 1993	The Noxious Weeds Act 1993 defines the roles of government, councils, private landholders and public authorities in the management of noxious weeds, according to their potential to cause harm to the local environment.	Personnel and sub-contractors are to be made aware of correct procedures of removal and treatment of noxious weeds if they are identified in the work area.
Water Management Act 2000	The WMA consolidates the Water Act 1912 and the Rivers and Foreshores Improvement Act. It deals with surface and ground water management. Approval is required to undertake water supply works, drainage works, or floodplain works. The WMA provides a scheme for the transitional recognition of permits granted under the Water Act 1912.	Condition AN2 of the Project Approval requires water licensing.

3.1.1 Licences & Permits

Table 4: Licences & Permits Required

Legislation	Licence / Permit	Timing and Responsibility
National Parks and Wildlife Act 1974	Permit to collect seed/cuttings from a threatened plant	Enquiries to be made as to permit requirements for any collection and propagation of threatened species proposed for inclusion in planting.
Fisheries Management Act 1994	• Notification of dredging and/or reclamation works in waterways • Permit to obstruct fish passage • Permit to damage or remove aquatic vegetation	As the works proposed are being conducted under an existing part 3A approval, the requirements of the *Fisheries Management Act 1994* do not apply.
National Parks and Wildlife Act 1974	Licence to rescue protected Fauna under Section 132(c) of the *National Parks and Wildlife Act 1974*	An appropriately licenced Fauna Spotter/Catcher will be engaged prior to commencement if clearing is required
Animal Research Act 1995	Ethics approval through an approved Animal Care and Ethics Committee for fauna monitoring involving trapping	All monitoring of fauna which includes trapping will be carried out by an appropriately licenced contractor.
Water Act 1912, Part 5 Interception of Groundwater during Construction	Licence for the interception of groundwater during construction	Not relevant to the proposed areas, groundwater will not be intercepted.

4 ENVIRONMENTAL MANAGEMENT

4.1 Environmental Management Structure & Reporting

The Project Manager, Superintendent and Environmental Officer will be responsible for ensuring sufficient resources are allocated to install, inspect, maintain and remove environmental controls throughout the construction period.

This section provides details on staff responsibilities of all key personnel that have obligations with respect to the development, implementation and monitoring associated with the CEMP.

4.1.1 Project Manager

The Project Manager is responsible for the overall project management and delivery. He/she is responsible for delegating responsibility to the management team to ensure that the environmental impacts are minimised and obligations met in the areas of their control and that, through an integrated and collaborative approach to management, the responsibilities are passed down through the work force and that no risks or obligations fall through gaps.

Specifically, the Project Manager is responsible for:

- Reviewing and authorising the Construction Environmental Management Plan (CEMP) and other project plans;
- Assigning environmental related responsibilities to all project personnel;
- Ensuring all project personnel are suitably trained, and possess the necessary skills, to undertake their designated environmental responsibilities;
- Continually monitoring of environmental performance to ensure compatibility and continued effectiveness with the policy and objectives;
- Communicating environment performance to the Operations/Construction Manager;
- Providing sufficient resources to ensure the CEMP practices are implemented;
- Participating in the review of the project environmental system and other relevant environment meetings and programs; and
- Ensuring appropriate training in environmental issues is provided to all project personnel.

4.1.2 Superintendent/Foreman

The Superintendent/Foreman reports to the Project Manager and will have a direct role in the compliance with designated environmental procedures and controls. They will also be responsible for ensuring controls are installed prior to works, checking the site on a regular basis and ensuring that regular maintenance is undertaken to minimise environmental impacts and that personnel are provided with appropriate environmental 'Toolbox' training.

Specifically, the superintendent will be responsible for:

- Ensuring procedures in the CEMP are followed;
- Perform surveillance and monitoring of environmental controls to ensure that they are established and maintained with requirements;
- Ensuring the environmental protection requirements are communicated to all personnel and subcontractors under his/her control;

- Identifying and reporting environmental non-conformance and notifying the EO of the suspected non-conformance;
- Carrying out the agreed rectification works after identification of non-conformance; and
- Competing environmental surveillance activities in the site diary as required.

4.1.3 Environmental Officer

The Environmental Officer is responsible for ensuring the compliance with the CEMP, environmental conditions of approval, legislation and the management plans until conditions have been satisfied. The standard hours of work for the Environmental Officer position will be between 7am to 5pm, and their primary tasks will involve the following:

- Ensure best practice environmental management is undertaken;
- Ensure the relevant environmental management plans are in compliance (refer Appendix C);
- Maintain environmental records including monitoring data, complaints (refer Appendix D) and environmental incident reports (refer Appendix E);
- Assist contractors in fulfilling their environmental responsibilities during construction activities;
- Liaison with external agencies where necessary;
- Responsibility for receiving and responding to complaints;
- Ensure that all environmental obligations are identified, implemented and undertaken;
- Deliver environmental component of site inductions;
- Prepare, review and maintain environmental documentation;
- Undertake programmed monitoring;
- Complete programmed environmental inspections and audits;
- Review and maintain the CEMP regularly and implement the necessary changes;
- Determine appropriate corrective actions where required; and
- Submit a Compliance Report to the Director General within three weeks of the completion of each earthworks stage until completed.

4.1.4 Subcontractors

As a minimum, subcontractors and their employees will be required to comply in full with the requirements of the CEMP as it applies to site environmental management and control. Sub-contractors' personnel are considered equivalent to project personnel in all aspects of environmental management and control and their responsibilities.

Sub-contractor personnel will be included in the onsite induction process. The Environmental Officer and/or Superintendent/Site Foreman will monitor the work of subcontractors working on site to ensure best practice environmental management is being undertaken.

4.2 Project Team Resources

The resources required to implement the control measures and obligations identified will include:

- General labour to install and maintain controls during construction activities and following storm/wet weather events;
- Specialist input from consultants;
- Heavy plant and equipment such as bulldozers and excavators;
- Hand tools;
- Fencing and flagging tape to secure protected areas or trees;
- Erosion and sediment equipment including sand bags, sediment fence and sediment basin treatment chemicals (e.g. gypsum); and
- Emergency response equipment such as spill kits.

4.3 Environmental Training

Two main forms of environmental training will be provided on site:

- Site induction; and
- Toolbox meetings.

Records of inductions, toolbox meetings and other specific training will be maintained by the Environmental Officer and a copy kept on site for the life of the project. The records shall include the topic of training carried out, dates, and names of people who undertook the training and trainers details.

4.3.1 Induction

Prior to any staff working on site, all personnel and subcontractors will undertake a site induction. These inductions will address several elements including occupational health and safety, quality and environment.

The environmental component of the site induction shall be prepared by the Environmental Officer, and will address a range of environmental issues including, but not limited to:

- The CEMP (purpose, objectives and key issues);
- Legal requirements including due diligence and duty of care of each person on site;
- Environmental responsibilities;
- Conditions of licences, permits and approvals;
- Significant environmental issues including sensitive areas, site boundaries, designated areas for washing plant and equipment, refuelling and maintenance of vehicles;

- Storage of hazardous chemicals and fuels;
- Location of hazardous chemical/fuels spill kits and contents;
- Environmental management for key issues (protected and native flora and fauna, soils, salt and fresh water wet lands, flora and fauna, cultural heritage etc.);
- Dogs, cats and other domestic animals are prohibited from entering the site;
- Response process for environmental harm/incidents;
- Protection and maintenance of environmental controls;
- Procedure for identification of cultural heritage items on site;
- Mitigating dust, noise and vibration during construction works; and
- Sediment and erosion control requirements.

A Cultural Heritage Induction will be carried out for all construction staff involved in undertaking initial subsurface disturbance prior to working on site.

4.3.2 Staff Training

Staff and subcontractors working on site will be provided with environmental training to achieve a level of awareness and competence appropriate to their assigned activities.

Targeted environmental awareness training will be provided to individuals, groups of workers, or those undertaking an activity with a high risk of environmental impact by providing regular toolbox meetings. Toolbox training is provided to ensure that relevant information is communicated on site and to provide an opportunity for feedback on issues of interest or concern. Additionally, toolbox training will be provided when updates and amendments have been made to the CEMP.

Training will generally be prepared and delivered by the Environmental Officer or a nominated delegate. Training topics may include:

- Content and requirements of the CEMP and Environmental Management sub-plans;
- Key environmental issues such as noise, vibration control, dust control, flora and fauna, environmental protection areas;
- Environmental emergency response;
- Erosion and sediment control, installation and maintenance of controls;
- Management of works near no-go zones such as environmental protection areas;
- The efficient use of plant and equipment;
- Waste management, minimisation and recycling;
- Flora and fauna protection including no-go zones;
- Management of contaminated soils;
- Spill response equipment;
- Working near protected vegetation;
- Protecting waterways and riparian zones; and
- Management of ASS and potential contaminated soil.

4.3.3 Training Records

Records of all training would be kept and maintained on site and should include:

- Who was trained;
- When the person was trained;
- The name of trainer; and
- A general description of the training content.

A training register is provided in Appendix F.

4.4 Communications

4.4.1 Communication Process

All communication with internal and external parties regarding the environmental management during construction of the Project would be conducted in accordance with Table 5.

Table 5: Communication

Subject	Responsibility	Action	Frequency
CEMP (authorisation)	Project Manager	Submit to approval agency	Minimum one month prior to works commencing as per approval.
CEMP (distribution)	Project Manager	Distribute for implementation	Prior to commencement of site inductions
Site inspection observations and actions	Environmental Officer	Record in the environmental register	Weekly
Liaison with the OEH, Fisheries and Tweed Shire Council	Project Manager/ Environmental Officer	Notify agencies of any staff contacts (Project Manager and Environmental Officer)	Prior to commencement of work
Pollution Incident	Project Manager/ Environmental Officer	Report Incident Maintain incident register	Immediately after personnel safety check Verbal notification within 2 hours Written notification within 24 hours
Public Compliant Management	Project Manager/ Environmental	Circulate project information letter with 24 hour	Prior to commencing work

Subject	Responsibility	Action	Frequency
	Officer	contact number to nearby residents. Maintain complaints register	
Notification of local residents re: possible noise/dust impacts	Environmental Officer	Letter mail out	At least 10 working days prior to the commencement of works.
Extended working hours	Project Manager	Letter mail out	After receiving approval from Tweed Shire Council and at least 5 days prior to work commencing.
Discovery of threatened fauna	Environmental Officer	Telephone OEH representative	Same day
Discovery of archaeological material, heritage items	Project Manager	Telephone NPWS representative	Same day
Discovery of skeletal material	Project Manager	Contact NSW Police	Same day
CEMP non conformance	Environmental Officer	Issue report	As required
Environmental Performance	Environmental Officer	Contractor to remedy	Every month
Audit	Environmental Officer	Provide report	Every 6 months
Management review	Project Manager and Environmental Officer	Provide minute of meetings	Six monthly

4.4.2 Complaints Management

To allow for community complaints during project construction, the following contact details will be provided on the TSC website:

- Telephone number
- Postal address
- Email address

A Complaints Register will be kept electronically as part of the CEMP (refer to Appendix D). The Environmental Officer is responsible for recording environmental complaints in this register and will log, track and respond to complaints within a specific timeframe. The following details will be recorded in the register:

- Date
- Time
- Type of communication (telephone, mail, email, meeting)
- Name, address and contact number of complainant where provided
- Nature of complaint
- Details
- Action taken in response including whom the complaint was referred to
- Details of any monitoring undertaken to confirm the complaint had been satisfactorily resolved.

Verbal notification will be provided to the TSC contact person within 24 hours of receiving a complaint regarding any environmental issue, including pollution, arising from the proposed works. A report will be prepared and submitted to the TSC contact person with details of the complaint and the action taken to address the problem. In addition, during the construction phase, weekly written notification of complaints and actions taken to close out the issues will be provided to TSC.

4.5 Environmental Records

The following records will be maintained as part of the project records:
Details of qualifications for individuals responsible for environmental monitoring

- The CEMP (all versions) with attached regulatory licences and permits
- Regulatory authority inspection reports
- Correspondence with regulatory authorities
- Monitoring results
- Induction and training records
- Inspection checklists (Appendix G)
- Waste quantity reports
- Environmental accidents/incidents/emergency reports
- Complaint reports
- Non-conformance reports (refer Appendix C)
- Audit reports (internal and external)
- Management review minutes and action taken.

4.6 Emergency Incidents

All environmental incidents will be recorded and addressed by the Environmental Officer. Incidents will be classified, categorised and registered in the Project Environmental Incident Register. The following items will generally need to be reported on:

- Contributing factors (e.g. how and why)
- Severity classification
- Rectification actions
- Notification requirements.

All incidents must be investigated as soon as possible after the event. The Project Manager will establish an investigation team to investigate all Class 1 and 2 environmental incidents. When an environmental incident is part of an OH&S incident, the Project Manager shall nominate an OH&S representative as part of the investigation team. The investigation shall address the cause and/or impact of the incident.

Table 6: Definition of Incident Classification

Incident Class	Definition
1	Clean-up/rehabilitation costs greater than $50,000
2	Clean-up/rehabilitation costs greater than $10,000 and less than $50,000
3	Clean-up/rehabilitation costs less than $10,000

4.7 Emergency Contacts & Response

4.7.1 Emergency Contacts

An up-to-date list of emergency response personnel, organisations and contact details will be maintained and posted at the site office and facilities. Table 7 lists the key personnel and emergency services responsible during the environmental emergency.

Environmental emergency contact details are listed below and will be updated as required.

Table 7: Environmental Emergency Contact Details

Organisation/Position	Name	Telephone #
24 Hour Project Contact Line	Reg Van Rij	0410 540 371
Project Manager/LEDA	Reg Van Rij	07 5570 5500 0410 540 371 Email: rvr@ledagc.com
Construction Manager	Dennis Hughes	0417 797 099 Email: leda@hughesintermodal.com.au
Environmental Officer/SMEC	Jon Alexander	(07) 5578 0250, 0424 152 298, jon.alexander@smec.com
NSW Police (Tweed Heads)		(07) 5536 0999
NSW Fire Brigade (Tweed Heads)		(07) 5536 2222
NSW Ambulance Service (Tweed Heads Division)		13 12 33
Tweed Heads District Hospital		(07) 55361133
John Flynn Hospital and Medical Centre (Tugun)		(07) 55989000
SES NSW		132500
Poisons Information		131126
Veterinary Hospital (Billinudgel)		(02) 66803480
Wildlife Relocation and Management Services		(07) 5590 4301
Currumbin Sanctuary		(07) 5534 1266
Office of Environment and Heritage (OEH) (DECC)	Chris Sayer	(02) 6640 2500 131 555
Fisheries	Pat Dwyer	(02) 6626 1397 1300 550 474
Tweed Shire Council	General Enquiries	(02) 6670 2400
	Mick Denny	Phone: (02) 6670 2602 Email: MDenny@tweed.nsw.gov.au
	Colleen Forbes	Phone: (02) 6670 2596 Email: cforbes@tweed.nsw.gov.au
Cultural Heritage Advisor	Everick Heritage Consultants	0432 816 460 (07) 3368 2660

4.7.2 Response

The Environmental Officer or the Project Manager will notify the relevant authorities (such as OEH Regional Manager, or OEH Pollution Line for after hours, and DPI) of pollution incidents on or around the site which have occurred as follows:

- If the actual or potential harm to the health or safety of human beings or ecosystems is not trivial (at the discretion of the Environmental Officer); or
- If the actual potential loss or property damage (including clean-up costs) associated with pollution incident exceeds $10,000 in NSW.

All environmental incidents shall be investigated and reported to the Project Manager immediately after the event is discovered. Local residents affected will be notified immediately.

The Environmental Officer will prepare an incident report which will be recorded, distributed to the appropriate authorities (e.g. Tweed Shire Council, OEH etc.) and to the Project Manager, and stored on site. The report shall include the following:

- Contributing factors, e.g. how / why;
- Severity classification;
- Rectification actions; and
- Notification requirements.

During construction activities, inspections and preventative actions to be performed by the Environmental Officer will include:

- Daily inspections of active work sites;
- Routine environmental checklists;
- Deliver ongoing environmental training; and
- Environmental audits of work sites, subcontractors and compliance issues.

In the event of an environmental incident, all necessary actions shall be taken to minimise the size and any adverse effects from the release.

In the event that significant environmental harm is caused or likely to be caused, as a result of construction activities, the Environmental Officer will advise the Project Manager to stop works.

The Project Manager will then have ultimate responsibility to stop works.

5 IMPLEMENTATION

5.1 Risk Assessment

The consideration of environmental risks associated with the proposed development within the SSPP has been assessed.

As part of the preparation of relevant Environmental Management Plans, an analysis was undertaken which:

- identified environmental issues through examination of the Director General's Requirements in MP06_0316 and MP08_0200.
- reviewed the findings of preliminary environmental assessments documented within the literature of James Warren & Associates, CRG and Yeats undertaken as part of the various studies included in the Concept, Project and Development Approvals:
  - Fauna survey results;
  - Flora survey results;
  - Geotechnical findings;
  - Surface water quality;
  - Groundwater quality;
  - Noise assessment;
  - Air quality assessment; and
  - Cultural heritage assessment.
- examined potential impacts and proposed mitigation measures in relation to the identified impacts; and
- examined residual risks from impacts after the application of mitigation measures.

Classification of 'likelihood" is shown in Table 8. Classifications for 'consequence' is shown in Table 9.

Table 8: Likelihood Criteria

Likelihood of Occurrence [over duration of project]	
Almost Certain	90 – 100%
Likely	70 – 90%
Possible	30 – 70%
Unlikely	10 – 30%
Rare	< 10%

Table 9: Consequence Scoring

Consequence	Classification						
	Cost	Time	Quality	Quantity	Community	Public & Workforce Safety	Environment
Extreme	>$500K	More than 3 weeks delay to critical path	Failing to meet spec. Unusable Risk to public health	> 50% shortfall	Extreme negative media coverage / State Government intervention	Death or permanent incapacitation	Catastrophic site impact / high local impact / moderate external impact / serious long-term cumulative effect
Major	$100K - $500K	1 – 3 week delay to critical path			Significant negative media coverage / Formal council intervention	Major injury / illness	High site impact / moderate local impact / minimal external impact / minor long-term cumulative effect
Moderate	$50K - $100K	2 days – 1 week delay to critical path	Useable but significant KPI-based cost penalty	25% shortfall	Critical media coverage / formal council request for information	LTI	Moderate site impact / Minimal local impact / possible long-term cumulative effect
Minor	$10K - $50K	1 to 2 days delay to critical path			No. Of community complaints above expected average	Minor injury / illness	Minimal site impact / easily controlled
Insignificant	<$10K	< 1 day delay	Breach of one or two minor parameters not in customers' specs	< 5% shortfall	No. Of community complaints at expected average	No injury / illness	No impact

Scores for 'likelihood' and 'consequence' will result in an overall Risk Rating Score as shown in Table 10 below.

Table 10: Risk Rating Score

Likelihood	Consequence				
	Insignificant	**Minor**	**Moderate**	**Major**	**Extreme**
Almost Certain	M	H	H	E	E
Likely	M	M	H	VH	E
Possible	L	M	H	VH	VH
Unlikely	L	M	M	H	VH
Rare	L	L	L	M	H

E = Extreme
VH = Very High
H = High
M = Medium
L = Low

5.1.1 Results of the environmental risk analysis

Table 11: Risk assessment

No	Risk Description	Description of consequence	Likelihood	Consequence	Ranking
1	Breach of environmental conditions	Community/Agency concerns raised requiring considerable diversion of resources. Possible delay to construction.	Unlikely	Major	H
2	Delays in environmental permits	Delays to project	Likely	Insignificant	M
3	Noise, dust and vibration	Adverse impact on community and ecology	Possible	Major	VH
4	Threatened fauna	Loss of EPBC (Environment Protection and Biodiversity Conservation Act) or TSC (Tweed Shire Council) threatened fauna during clearing	Unlikely	Extreme	VH
5	Threatened flora	Loss of EPBC or TSC threatened flora during clearing outside of construction footprint	Unlikely	Extreme	VH
6	Endangered ecological community	Clearance of TSC endangered ecological community outside construction footprint	Unlikely	Extreme	VH
7	Water quality Cobaki Broadwater	Polluted water due to spill	Possible	Extreme	VH
8	Groundwater Pollution	Polluted groundwater	Rare	Moderate	L
9	PASS/ASS impacts	Additional costs for treatment/delays to work	Rare	Moderate	L
10	Vegetation removal outside construction footprint	Breach of environmental conditions/penalties	Unlikely	Moderate	M
11	Air quality	Community health risk/concern	Possible	Moderate	H
12	Introduction of weeds	Threat to ecological integrity	Possible	Moderate	H
13	Sedimentation and erosion	Penalties/sediment entering environment	Possible	Moderate	H

E = Extreme
VH = Very High
H = High
M = Medium
L = Low

6 ENVIRONMENTAL MANAGEMENT ACTIVITIES & CONTROLS

6.1 Environmental Management Plans

This CEMP is a framework document which is predominantly derived from a number of environmental management plans. Each environmental management plan contains mitigation measures relevant to the pre-construction and construction stages of the proposed earthworks.

6.1.1 Fauna Management Plan

As a requirement of Condition C4 of MP06_0316, all future applications are to include, where relevant, stage-specific management plan updates to the Fauna Management Plan (FMP). The mitigation measures detailed below relate to the entire site and may not be directly relevant to the SSPP.

Objectives:

The main objective of the FMP is to ensure that the proposed development will have minimal impacts to native fauna and their habitat by:

- Identifying actual and potential impacts to fauna;
- Identifying applicable legislative requirements;
- Identifying fauna habitat to be retained within Environmental Protection/No-Go Zones; and
- Recommending practical mitigation measures and monitoring requirements to manage identified impacts to fauna.

Targets:

The following targets have been established for the management of fauna impacts during construction works associated with the SSPP:

- Minimal loss or significant impacts to native fauna, with no loss of endangered or threatened fauna;
- Minimal loss or significant impacts to identified habitat trees and/or features;
- No decrease in the diversity of the local protected fauna species population;
- Adequate control/management of any introduced/invasive pest species, where identified; and
- No infringements of the regulatory requirements relevant to fauna.

Actions:

Table 12 details mitigation measures proposed to ensure that the proposed development will have minimal impacts to native fauna and their habitat.

Table 12: Mitigation Measures for Fauna Management

Mitigation Measure	Responsibility	Construction Phase		
		Prior	During	Post
Parawebbing around vegetation protection areas, as per Appendix B – Earthworks Fencing Plan.	Environmental Officer	X		
Installation of permanent fauna-friendly fencing (posts and rails) on the boundary of the Saltmarsh Rehabilitation Area and Compensatory Habitat Area and erection of signage on fencing stating 'No entry – Environmental Protection Area'.	Construction Manager/Site Superintendent Sign off: Environmental officer	X		
Installation of sediment and erosion controls to protect drainage lines, Compensatory Habitat Area and Saltmarsh Rehabilitation Area to be retained	Construction Manager/Site Superintendent Sign off: Environmental officer	X		
Flagging of any identified habitat features (hollows, nests, etc.)	Fauna Spotter Catcher (under direction of the Environmental Officer)	X		
Installation of signage at the Cobaki Parkway site entry and along Cobaki Parkway to notify staff, particularly plant operators, of the possible occurrence of potoroo.	Construction Manager/Site Superintendent Sign off: Environmental officer	X		
Visual inspection for koalas in trees to be removed on the day of clearing, prior to any vegetation removal	Fauna Spotter Catcher (under direction of the Environmental Officer)	X		
Site-specific threatened species inductions for all site staff. Induction will cover issues relating to threatened species, designated and restricted areas of access and waste disposal	Environmental Officer	X		
Ongoing education of site staff through 'toolbox talks', ensuring important information relating to the protection of fauna are reiterated regularly. To be signed off by all attendees.	Environmental Officer		X	
Two stage clearing ensuring that non-hollow bearing trees are cleared first	Fauna Spotter Catcher (under direction of the Environmental Officer)		X	
Relocation of hollows	Environmental Officer/Fauna Spotter Catcher		X	
Presence of spotter/catcher throughout vegetation clearing/removal of saltmarsh	Environmental Officer & Fauna Spotter			

Mitigation Measure	Responsibility	Construction Phase		
		Prior	During	Post
and freshwater wetland communities	Catcher			
Works are to cease immediately and the Environmental Officer and Fauna Spotter Catcher is to be contacted if a nesting animal or a nest with eggs/young is observed within the earthworks area.	Environmental Officer and Construction Manager		X	
Weekly fencing inspection, biweekly during substantial clearing.	Environmental Officer/ Site Superintendent		X	
Two-stage post-clearing and earthworks report to Tweed Shire Council	Environmental Officer		X	
Retention and stockpiling of large woody debris for use in the habitat augmentation program.	Environmental Officer		X	
Weekly inspection of construction site/works (Weekly Construction Checklist – Appendix F of FMP)	Environmental Officer		X	
Inspection to ensure that grubbing operations are leaving the site free draining with no ponding of stormwater which may result in breeding habitat for mosquitos and cane toads or cause alterations to the hydrology of wetland habitats.	Environmental Officer		X	
Maintenance of protection fencing and monitoring to ensure that non permitted activities do not occur within protected areas	Environmental Officer		X	
Monitoring compliance with the *Companion Animals Act 1998* (That no unrestrained dogs are allowed on site during construction)	Environmental Officer		X	
Construction/design and Installation of nest boxes. Recording location of installed nest boxes for future monitoring.	Environmental Officer	X	X	
Maintenance and monitoring of nest boxes within the retained vegetation areas for a minimum of 5 years.	Ecologist (under direction of the Environmental Officer)			X
Contact details for the ecologist/fauna specialist, Wildlife Relocation and Management Services (07 5590 4301) and the Local Veterinary Hospital (Billinudgel: 02 6680 3480) must be kept at all times in the site offices and with the on-site Environmental Officer.	Environmental Officer	X	X	
Notification of any additional threatened	Environmental Officer	X	X	

Mitigation Measure	Responsibility	Construction Phase		
		Prior	During	Post
species identified to DECCW (NPWS)				
No works within 100m of the raptor nests (subject to confirmation of usage)	Project Manager/ Environmental Officer		X	
Erecting at least 2 artificial nesting platforms within the Saltmarsh Rehabilitation Area	Project Manager/ Environmental Officer		X	
Adaptive pest management	Ecologist (under direction of the Environmental Officer)		X	X
Annual Fauna Monitoring	Ecologist (under direction of the Environmental Officer)	X	X	X
Removal of protection fencing	Site Superintendent Sign off: Environmental Officer			X

Two-Stage Post-Clearing and Earthworks Report

Given the potential time lapse between clearing and earthworks activities, the Post-Clearing and Earthworks Report will be completed in two stages. At the completion of clearing activities, the project ecologist/environmental officer in consultation with the fauna specialist will produce a Draft Stage 1 report providing a summary of the results of pre-clearing surveys, clearing operations and hollow relocations. A follow-up Stage 2 report will then be prepared to follow up on any additional issues that may have resulted from Earthworks activities. A separate two-stage report will be prepared for activities within each stage of construction.

Details within each report will include:

- Information on clearing and earthworks operations, dates, procedures, areas
- Details of habitat trees
- Information on tree species and tree sizes being used for breeding or roosting by fauna, including location, size, height and girth (i.e. for information base purpose).
- Detailed information about any incursion into no-go zones.
- Assessment against the performance criteria detailed in Section 8.
- Recommended remediation measures for any incursions into no-go zones.

Final reports will be submitted to TSC at the completion of Earthworks.

6.1.2 Vegetation Management Plan

In accordance with Condition C4 of MP06_0316, all future applications are to include, where relevant, stage-specific management plan updates to the Vegetation Management Plan (VMP) (SMEC, 2013). The mitigation measures detailed below relate to the entire site and may not be directly relevant to the SSPP.

Objectives:

The main objective of the VMP is to ensure that the proposed development will have minimal impact on local ecosystems, including threatened flora species. Specific objectives include:

- To protect all retained vegetation and threatened flora species from damage
- To prevent unnecessary clearing or disturbance of native vegetation
- To prevent degradation of aquatic and terrestrial habitats through threatening processes such as physical removal, weed invasion, water quality decline, soil erosion and compaction
- To minimise loss and damage to habitat trees and maximise reuse
- To develop and implement measures aimed at increasing the total amount of habitat available to other biota
- To ensure disposal of cleared vegetation is undertaken in an environmentally responsible manner
- To ensure all personnel understand their role in implementing this management protocols set out in the VMP.

Table 13: Mitigation Measures for Vegetation Management

Mitigation Measure	Responsibility	Prior to Construction	During Construction
Parawebbing/exclusion fencing installation around vegetation protection areas/ threatened flora species as per Earthworks Fencing Plan (Appendix B)	Construction Manager/Site Superintendent Sign off: Environmental officer	X	
Installation of sediment and erosion controls to protect drainage lines, freshwater wetland and saltmarsh wetland habitat to be retained	Construction Manager/Site Superintendent Sign off: Environmental officer	X	
Erosion and sediment control around vegetation protection areas	Site Superintendent/Construction Manager Sign off: Environmental Officer	X	X
Completion of the Pre-clearing Checklist (Appendix B of VMP)	Environmental Officer	X	
Maintenance of protection fencing	Environmental Officer/Construction Manager/Site Superintendent		X
Weekly fencing inspection, biweekly during substantial clearing	Environmental Officer and Site Superintendent	X	X

Mitigation Measure	Responsibility	Prior to Construction	During Construction
Notification of additional threatened species to DECCW (NPWS)	Environmental Officer	X	X
Two stage clearing ensuring non-hollow bearing trees are cleared first	Environmental Officer /project botanist and fauna specialist	X	
Ongoing education of site staff through 'toolbox talks', ensuring important information relating to vegetation protection are reiterated regularly. To be signed off by all attendees.	Environmental Officer and Construction Manager	X	X
Completion of the weekly construction checklist (Appendix C of VMP)	Environmental Officer		X
Post-clearing report to Tweed Shire Council	Environmental Officer		X
Hydroseeding of disturbed areas is undertaken	Environmental Officer		X
Inspection for weed species on a six monthly basis	Environmental Officer		X
Monitoring of stockpiled materials to ensure weed infested topsoil is stockpiled separately	Environmental Officer		X

Two-Stage Post-Clearing and Earthworks Report

Given the potential time lapse between clearing and earthworks activities, the Post-Clearing and Earthworks Report will be completed in two stages. At the completion of clearing activities, the project ecologist/environmental officer will produce a Draft Stage 1 report providing a summary of the results of pre-clearing surveys, clearing operations and hollow relocations. A follow-up Stage 2 report will then be prepared to follow up on any additional issues that may have resulted from Earthworks activities. A separate two-stage report will be prepared for activities within each stage of construction.

Details within each report will include:

- Information on clearing and earthworks operations, dates, procedures, areas
- Details of habitat trees
- Information on tree species and tree sizes being used for breeding or roosting by fauna, including location, size, height and girth (i.e. for information base purpose).
- Information on clearing operations, dates, procedures, areas
- Location and photographs of significant flora identified
- Detailed information about any incursion into no-go zones.
- Assessment against the performance criteria detailed in Section 8.
- Recommended remediation measures for any incursions into no-go zones.

Final reports will be submitted to TSC at the completion of Earthworks.

6.1.3 Construction Traffic & Pedestrian Management

In accordance with Condition C11 of MP06_0316, and Condition 28 and 25 of MP08_0200, the following provides an overview with respect to the proposed construction traffic management.

Objectives:

The proposed works will create no significant impact on Roads and Maritime Services (RMS) and local roads as the majority of vehicle movements will be occurring on-site. Boyd Street Overpass is blocked off to local traffic at its intersection with Inland Drive and no congestion is expected on Piggabeen Rd. Further, works will not impact any pedestrian pathways. Consequently, mitigation measures are predominantly focussed within the site.

Table 14: Mitigation Measures for Traffic and Pedestrian Management

Mitigation Measure	Responsibility	Prior to Construction	During Construction
Existing access tracks on site will be utilised.	Construction Manager / Site Superintendent		X
Ingress and egress of all vehicles will be via Piggabeen Road and Boyd Street	Construction Manager / Site Superintendent / Environmental Officer		X
Rock shake down or rumble grids will be installed at the exit points, to ensure sediment will not be dragged onto the road pavement.	Construction Manager / Site Superintendent	X	X
Work zone speed limit of 40km/hr is to be obeyed at all times.	Construction Manager / Site Superintendent		X
All material will be loaded and unloaded wholly within the site via excavators and truck and dog trailers.	Construction Manager / Site Superintendent	X	X
In order to make others aware of the on-going activity signs such as Entry to Authorized Personnel Only, Personal Protective Equipment must be worn, etc. will be prominently displayed.	Construction Manager / Site Superintendent		X
Under no circumstances shall an employee answer an incoming or make an outgoing phone call whilst operating machinery or a vehicle.	Construction Manager / Site Superintendent		X
Any personnel controlling construction traffic should do so with the aid of portable two-way radios.	Site Superintendent		X
Surrounding road carriageways are to be kept clean of any material carried onto the roadway by construction vehicles.	Construction Manager / Site Superintendent		X

Mitigation Measure	Responsibility	Prior to Construction	During Construction
The work site shall be suitably protected and free of hazards which could result in tripping or falling by workers and road users. Hazards which cannot be removed shall be suitably protected to prevent injury to workers and road users, including sight impairment.	Construction Manager / Site Superintendent		X
Where level differences are significant, suitable barriers which prevent access shall be used.	Construction Manager / Site Superintendent		X

Reporting:
Complaints received regarding construction traffic will follow the reporting procedures outlined within this CEMP.

6.1.4 Noise & Vibration Management

A number of sensitive receptors, including the Woodlands Lakeside Golf Club, Cobaki Broadwater Village, and several small dwellings may be impacted by noise and vibration during construction.

In accordance with Condition C11 & C12 of MP06_0316, and Conditions 25, 29, 49, 50, 51 and 52 of MP08_0200, and the Noise Assessment undertaken by CRG (2013) the following provides an overview of the proposed management for noise and vibration.

Objectives:

- To minimise potential impacts of noise and vibration from construction activities;
- Identification and implementation of best practice management techniques for minimisation of noise and vibration emissions.

Table 15: Mitigation Measures for Noise and Vibration Management

Mitigation Measure	Responsibility	Prior to Construction	During Construction
Hours of Work must be adhered to: • Between 7am and 5pm, Mondays to Saturdays • No work is permitted on Sundays and public holidays.	Construction Manager / Site Superintendent		X
Unless previously approved/agreed with relevant authorities, rock breaking, rock hammering, sheet piling, pile driving and any similar activity are only permitted between the following hours: • 9am to 12pm, Monday to Saturday • 2pm to 5pm, Monday to Saturday	Construction Manager / Site Superintendent		X

Mitigation Measure	Responsibility	Prior to Construction	During Construction
Where possible, earthworks should move in a southwest to northeast direction so that a southwest working face provides physical screening to the offsite dwellings to the south.			X
The crusher and screen should be located behind an earth mound/berm where possible to provide acoustical screening of noise emissions.	Construction Manager / Site Superintendent		X
Ensure that workers are trained to manage the use of noise producing plant or equipment in a way that noise is minimised.	Construction Manager / Site Superintendent	X	
Ensure all plant is maintained in good condition, with all reasonable and fesible acoustic treatments installed.	Construction Manager / Site Superintendent		X
Ensure that wherever practical, and where sensitive receivers may be affected, piling activities are completed using bored piles.	Construction Manager / Site Superintendent		X
Plant and equipment should be turned off when not in use or throttled down to a minimum.	Construction Manager / Site Superintendent		X
Vibration levels must not exceed the Criteria presented in the *Environmental Noise Management – Assessing Vibration: A Technical Guide (DEC, 2006)*	Construction Manager / Site Superintendent		X
All reasonable steps shall be undertaken to muffle and acoustically baffle all plant and equipment.	Construction Manager / Site Superintendent		X
The use of vibratory compaction equipment (other than hand held devices) within 100m of any dwelling house, building or structure is strictly prohibited.	Construction Manager / Site Superintendent		X
Identify nearby residents and other sensitive land uses and notify of vibration generating activities if required.	Construction Manager / Site Superintendent / Environmental Officer	X	X
Safety inductions prior to the commencement of construction, including awareness of commitments, directives, working hours and managing equipment to minimise vibration impacts.	Site Superintendent / Environmental Officer	X	
Ensure that all site workers have suitable personal protective equipment (PPE) to be worn at all times when near or operating plant and equipment making noise.	Site Superintendent		X

Mitigation Measure	Responsibility	Prior to Construction	During Construction
In the event of complaints from nearby residents, which Council deem to be reasonable, the noise from the construction site is not to exceed the following: A. Short Term Period (4 weeks) – $L_{Aeq,\ 15min}$ noise level measured over a period of not less than 15 minutes when the construction site is in operation, must not exceed the background level by more than 20dB(A) at the boundary of the nearest likely affected residence. B. Long term period (the duration) – $L_{Aeq,\ 15min}$ noise level measured over a period of not less than 15 minutes when the construction site is in operation, must not exceed the background level of more than 15dB(A) at the boundary of the nearest affected residence.	Construction Manager/Site Superintendent		X

Reporting:

- The daily site diary will be used to record auditory observations during site works when necessary.
- Where required, noise and/or vibration monitoring results will be reviewed by the Environmental Officer and kept on file on site.
- Monitoring results will be checked on a regular basis and recorded on the weekly environmental checklist in addition to periodic reporting to Project Managers.
- In the event of receipt of a noise complaint the following timeframes for response will be provided:
    - The complaints register will be updated within the same work day with timeframe for response/action noted
    - Responses to resident complaints will be completed within two business days
    - Complaints will be submitted to TSC weekly and include details of the complaint and actions carried out to close out the complaint.

6.1.5 Cultural Heritage Management

In accordance with Condition C4 and C15 of MP06_0316, and Conditions 25, 32, 37, 54, 55, 56 and 61 of MP08_0200, a Cultural Heritage Management Plan (Everick, 2009) was prepared.

Objectives:

- Minimise potential heritage impacts during construction activities;
- Maintain effective heritage management practices throughout the project in accordance with the site specific CHMP.

Table 16: Mitigation Measures for Cultural Heritage Management

Mitigation Measure	Responsibility	Prior to Construction	During Construction
All construction staff engaged in undertaking initial subsurface disturbance will undergo a Cultural Heritage Induction prior to working on site	Construction Manager /Site Superintendent / Environmental Officer	X	X
Findings of Aboriginal objects or human remains shall follow the outlined procedures within the Management Plan	Construction Manager /Site Superintendent / Environmental Officer	X	X

Reporting:

- A progress report shall be provided to the Registered Aboriginal Stakeholders every six months.
- A report shall be generated where a find has occurred and been investigated.

6.1.6 Erosion & Sediment Control

An Erosion and Sediment Management plan for the SSPP has been prepared in accordance with Conditions 25, 27, 36, 44, 45 and 46 of MP08_0200. ESC plans are included in Appendix A.

Objectives:

The following Sediment and Erosion Control objectives are outlined for the project:

- Ensure that statutory requirements and industry standards are met;
- Manage the activities in a way that minimises erosion and sedimentation impacts to the environment;
- Protect natural and rehabilitated landforms and minimise erosion; and
- Ensure all practicable measures are taken to prevent contaminated stormwater from adversely affecting the water quality at Cobaki Creek and Cobaki Broadwater.

Table 17: Mitigation Measures for Sediment and Erosion Control Management

Mitigation Measure	Responsibility	Prior to Construction	During Construction
Erosion and sediment control measures installed and operational	Construction Manager / Site Superintendent	X	X
No soil, sand, gravel, clay or other material shall be disposed of off the site without the prior written approval of Tweed Shire Council General Manager or his delegate	Construction Manager / Site Superintendent		X
The surrounding carriageways are to be kept clean of any material carried onto the roadway by construction vehicles	Construction Manager / Site Superintendent		X
Regular inspections are to be carried out to ensure adequate erosion control measures are in in good working order and in place	Environmental Officer		X
Additional inspections after each storm event by the Supervising Engineer to ensure the erosion control devices are intact, and no sediment has left the site or is deposited on public land or in waterways. The inspection program will be carried out until the site is fully rehabilitated to Councils satisfaction	Environmental Officer		X

Reporting:

Results of the monitoring program, the effectiveness of established water management structures, sediment control devices and the particulars of any remedial measures undertaken in instances where uncontrolled erosion or heavy sediment deposition occurred will be reported in annual reports.

6.1.7 Air Management & Dust Control

In accordance with Condition 25 and 47 of MP08_0200, air quality and dust must be managed.

Objectives:

- To minimise potential air pollution from construction activities;
- Maintain effective air management practices throughout the project.

Table 18: Mitigation Measures for Air & Dust Control Management

Mitigation Measure	Responsibility	Prior to Construction	During Construction
Areas disturbed by earthworks: • Disturb only the minimum area necessary for earthworks of the construction footprint • Remove topsoil and rehabilitate disturbed areas as soon as practicable after the completion of earthworks	Construction Manager / Site Superintendent / Environmental Officer		X
Haul roads: • All unsealed roads and frequently trafficked areas will be watered using water carts or sprays to minimise the generation of dust and particulate • All haul roads will have edges clearly defined with marker posts or equivalent to control their locations • Dust suppressant will be used when necessary	Site Superintendent / Environmental Officer		X
Topsoil stripping: • Tracks used by topsoil stripping scrapers during their loading and unloading cycle will be watered • Stripping will occur preferably in damp conditions of practical and during favourable wind conditions	Site Superintendent / Environmental Officer		X
Topsoils stockpiling: • Long terms stockpiles, not used for over six months, will be sown with cover crops • Drawings of temporary stockpiles including spoil and topsoil will be marked up as earthworks progress	Site Superintendent / Environmental Officer		X

Reporting:

Air quality management reporting is designed to comply with the Project Approval and Development Assessment conditions, and provide stakeholder access to relevant air quality information and data.

Monitoring data will be reported in the Annual Monitoring report for the project. Such reporting will include:

- Weekly visual monitoring of dust control;
- Air quality related complaints and management/mitigation measures undertaken;
- Management/mitigation measures undertaken in the event of any confirmed non-compliance with performance criteria; and
- Review of the performance of management measures.

6.1.8 Acid Sulphate Soils Management

In accordance with Condition C5 of MP06_0316 an Acid Sulphate Soils Management Plan has been prepared (SMEC, 2014).

Objectives:

Develop adequate management procedures and prevent impacts to the surrounding environment resulting from exposure of ASS to the atmosphere, groundwater and surface runoff.

Table 19: Mitigation Measures for Acid Sulfate Soils

Mitigation Measure	Responsibility	Prior to Construction	During Construction
Containment of ASS material stockpile and treatment areas (if required)	Construction Manager / Site Superintendent / Environmental Officer	X	X
No impacts to surface water or groundwater quality resulting from the disturbance storage, treatment or reuse of ASS material	Construction Manager / Site Superintendent / Environmental Officer		X
The leachate pH of the excavated material stockpile to range between 6.5 and 8.5 prior to release off site	Construction Manager / Site Superintendent / Environmental Officer		X
ASS material spills to be cleaned and /or neutralised within 12 hours of occurring	Construction Manager / Site Superintendent / Environmental Officer		X

Reporting:

In accordance with legislative requirements, the Director-General (DG) will be notified of any incident with actual or potential significant off-site impacts on people or the biophysical environment as soon as practicable after the occurrence of the incident. The DG will be provided with written details of the incident within seven days of the date on which the incident occurred.

In addition, an annual report will be prepared that reviews the performance of the Project against the ASSMP, provides an overview of environmental management actions and summarises monitoring results over the 12 month period.

6.1.9 Groundwater Management Plan

A Groundwater Management Plan (SMEC, 2012) has been written as a requirement of Conditions C4, C5 (1) & C5 (2) of MP06_0316.

Objectives:

The main objective of the Groundwater Management Plan is to ensure that the proposed development will have minimal impacts on the environment. Specific objectives include:

- Appropriate stewardship of natural resources;
- Protection of downstream flora and fauna habitats;
- Compliance with statutory requirements;
- Preservation of the existing groundwater conditions.

Table 20: Mitigations Measures for Groundwater Management

Mitigation Measure	Responsibility	Prior to Construction	During construction
Erosion and Sediment Control measures will be implemented and maintained during construction and operation in accordance with the approved Stormwater Management Plan and Erosion and Sediment Control Plan (Yeats, 2012).	Environmental Officer to authorise	X	X
Prior to construction activities in the immediate vicinity of the dip site, the area will be remediated in accordance with the approved RAP.	Construction Manager / Environmental Officer	X	
Any unidentified or accidental potential contamination encountered during construction will be documented, investigated by a specialist and remedial action applied before works continue in that area.	Construction Manager / Environmental Officer		X
Vehicles and machinery shall be maintained appropriately with no leaks.	Environmental Officer		X
Fill material shall be certified free from contaminants.	Environmental Officer		X
If required, mechanical dewatering of excavations shall be of short duration (hours/days) to minimise any alteration to natural groundwater regime	Site Superintendent / Environmental Officer		X
Works timed to avoid periods of high rainfall	Construction Manager		X
Possible re-use of water of suitable quality for dust suppression	Construction Manager / Site Superintendent		X
Discharge of water of suitable quality into constructed surface water bodies or local waterways	Construction Manager		X
Treatment or disposal of groundwater that exceeds water quality criteria, e.g.: • treatment of turbid water in settlement	Construction Manager / Environmental		X

Mitigation Measure	Responsibility	Prior to Construction	During construction
basins • application of lime to acidic water	Officer		
Containment of polluted water until appropriate collection and disposal to licensed facilities	Construction Manager / Environmental Officer		X
The Groundwater Monitoring Program (detailed in the GMP) shall be complied with.	Environmental Officer	X	X

Reporting;

The following documents shall be collected, maintained in the project files and made available for review by authorities if requested:

- Groundwater monitoring field sheets containing water level and field parameter data, and sampling, weather and well condition information
- Water quality meter calibration records
- Laboratory reports
- Up-to date data tables and figures (survey data, water level tables and contour figures, field parameter and laboratory analysis summary tables, etc)
- Corrective action notices
- Approvals/licenses for works, where required
- External consultants/contractor reports
- Contaminated water transport and disposal records

A monthly report collating and detailing all monitoring results, comparison to performance criteria and management/treatment procedures is to be prepared for TSC and the OEH. A copy will be maintained in the project file.

6.1.10 Contaminated Lands Management

In accordance with Condition C17 of MP06_0316, and Condition 20 of MP08_0200, a contaminated lands investigation has been undertaken.

Objectives:

- Avoid and minimise the environmental and human health risks arising from the disturbance of contaminated land encountered during construction of the project;
- Follow the guidelines set out in the statutory requirements for managing contaminated land and the transport of contaminated goods.

Table 21: Mitigation Measures for Contaminated Lands Management

Mitigation Measure	Responsibility	Prior to Construction	During Construction
Activities in the vicinity of the dip site shall be remediated in accordance with the approved RAP	Construction Manager / Environmental Officer	X	
Any unidentified or accidental potential contamination encountered during construction will be documented, investigated by a specialist and remedial action applied before works continue in that area	Construction Manager / Site Superintendent / Environmental Officer		X
Storage, use and accidental spillage of chemicals, fuel and dangerous goods shall be reported	Construction Manager / Site Superintendent / Environmental Officer		X
Vehicles and machinery shall be maintained appropriately with no leaks	Site Superintendent		X
Fill material shall be certified free from contaminants	Site Superintendent		X

Reporting:

Permanent records of the following activities will be kept on-site and updated regularly to enable audit/review by means of a simple check list or similar method:

- Locations of contaminated soil
- Records of field tests and visual assessments
- Records of sampling locations, chain of custody forms and laboratory reports
- Records of regulatory correspondence
- Quantities of material disposed of offsite and waste disposal locations
- Requests for corrective actions lodged
- Any changes to construction or management procedures

A certificate in the form of a Site Audit Statement completed by a NSW EPA Accredited Site Auditor shall be submitted to TSC prior to the dedication to land containing the approved remediation works.

6.1.11 Stormwater Quality Management

In accordance with Condition C6 of MP06_0316, Condition 16 of MP08_0200, a Stormwater Quality Management Plan has been prepared..

Objective:

The Stormwater Quality Management Plan determines appropriate management options for all intercepted groundwater and monitor effects on surrounding groundwater (levels and quality) as a result of any mechanical dewatering.

Table 22: Mitigation Measures for Stormwater Management

Mitigation Measure	Responsibility	Prior to Construction	During Construction
Rainwater Tanks	Construction Manager / Site Superintendent / Environmental Officer	X	X
Bio-retention Basins	Construction Manager / Site Superintendent / Environmental Officer	X	X
Treatment within open drains	Construction Manager / Site Superintendent / Environmental Officer		X
Grass buffers	Construction Manager / Site Superintendent / Environmental Officer		X

In the event that surface runoff or groundwater seepage occurs into newly formed drains at the site, this water will flow into formed temporary stormwater basins, which are planned to capture this water before discharging off-site. The stormwater retention basins shall be monitored to ensure that discharging runoff complies with the provisions of Council's Design Specification D7 - Stormwater Quality, before being released.

Reporting:

The performance of each of the stormwater mitigation measures and testing will be recorded during daily and monthly reporting as part of the overall environmental management of the site. The results of all monitoring will be included in an annual and final monitoring report which will be submitted to Tweed Shire Council.

6.1.12 Waste Management

The following outlines management actions with respect to waste management throughout construction in accordance with Condition 25 of MP08_0200.

Objectives:

- Implement onsite waste management measures in accordance with best practice to effectively manage waste materials;
- To minimise the production of waste using the most effective and efficient procedures practicable;
- Follow the waste hierarchy:
    - ***Reduce:*** Waste avoidance by reducing the quantity of waste being generated is the simplest and most cost-effective way to minimise waste. It is the most preferred option in the Waste Management Hierarchy and is therefore ranked first.

      Reuse: Reuse occurs when a product is used again for the same or similar use with no reprocessing. Reusing a product more than once in its original form reduces the waste generated and the energy consumed, which would have been required to recycle.

      Recycle: Recycling involves the processing waste into a similar non-waste product consuming less energy than production from raw materials. Recycling spares the environment from further degradation, saves landfill space and saves resources that were used to make the item in the first place.

      Dispose: Removing waste from worksites, compounds and offices and dumping in a licensed landfill site, or other appropriately licensed facility.

Table 23: Mitigation Measures for Waste Management

Mitigation Measure	Responsibility	Prior to Construction	During Construction
Soil, topsoil and mulch are to be stockpiled in allocated areas	Construction Manager / Site Superintendent		X
Hazardous wastes are to be stored in appropriate containers (as shown in Figure 4) and transported by a licensed waste transporter	Construction Manager / Site Superintendent / Environmental Officer		X
Concrete wash out areas located in designated locations and cleaned out on a regular basis.	Construction Manager / Site Superintendent		X
All other recyclable or non-recyclable wastes are to be stored in covered bins/skips at appropriate locations on site and emptied on a regular basis	Environmental Officer		X

Reporting:

Waste Management protocols for the site will be subject to review and the performance of such protocols will be described in annual environmental reporting. Within the annual reports, registers of waste (refer Appendix I) will be analysed and presented.

6.1.13 Biting Midge and Mosquito Control

A Biting Midge and Mosquito Control Management Plan (McGinn, 2008) has been prepared in accordance with Condition 66 of MP08_0200.

Objective:

The Biting Midge and Mosquito Control Management Plan aims at preventing a public health risk by the transmission of Ross River virus and Barmah Forest virus. Specific management areas targeted by the plan include salt-marsh and if required, stormwater management areas that provide fresh/brackish water habitat. Additional integrated mosquito management strategies are also included. It is noted that existing wetland areas targeted for larvicides application within the plan do not include the compensatory Wallum Froglet and Freshwater Wetland management areas.

Table 24: Mitigation Measures for Biting Midge and Mosquito Control

Mitigation Measure	Responsibility	Prior to Construction	During Construction
Restricting cattle movement away from mosquito breeding sites including salt-marsh and fresh/brackish wetlands. The location of exclusion fencing is provided in Appendix B.	Construction Manager / Site Superintendent		X
Short-term application of mosquito larvicides. The larvicide considered to have the highest margin of non-target species (including Wallum froglet) safety will be used. The proposed formulations are short-acting and typically detectable for less than 48hrs.	Environmental Officer		X

Reporting:

Records of all larvae surveys following inundation will be documented in an annual report and the results of long term scientific analysis will be documented and reported in the annual environmental report submitted to TSC and OEH.

6.2 Environmental Management Plans & Maps

A number of maps have been prepared to support the environmental management plans and are relevant to this CEMP.

These figures include:

- Environmental Protection/No-Go Zones –Earthworks Fencing Plan (Appendix B of this CEMP)
- The location of environmentally sensitive areas including:
    - Threatened Flora Records (Figure 3 of the VMP)
    - Endangered Ecological Communities (Figure 4 of the VMP)
    - Threatened Fauna records and potential habitat (Figures 2 – 6 of the FMP)
- Site facilities (Work areas, machinery and vehicle paring, fuel and chemical storage areas, soil dumps) (Figure 2 of this CEMP)
- Sediment and erosion control measures (Appendix H of this CEMP)

6.3 Environmental Schedules

Environmental schedules are copies of forms, reports or registers that are used during the projects day to day management. The latest versions of the schedules will be appended to the CEMP for easy access and will be updated as required during the construction period. Table 25 lists the environmental records that will be implemented on the project.

Table 25: Environmental Record List

Record Reference	Record Form Name	Notes
Appendix C (CEMP)	Non Compliance and Corrective Action	Used on an ‘as needs’ basis when non-compliance occurs
Appendix D (CEMP)	Complaints Register	Used to record complaints
Appendix E (CEMP)	Environmental Incident Register	Used on an as-need basis when an environmental incident occurs
Appendix F (CEMP)	Environmental Training Register	Records all personnel who have undertaken environmental training as required prior to working on site
Appendix G (CEMP)	Site Inspection Checklist	Used for weekly environmental inspection of construction works and environmental management
Appendix I (CEMP)	Waste Register	Used monthly to track waste materials on site
Appendix J (CEMP)	Monitoring Checklist	Used to verify that required monitoring has been undertaken.
Appendix B (VMP)	Pre-clearing Checklist	To be used prior to the commencement of clearing
Appendix B (FMP)	Hollow Inspection Checklist	To be used where hollows are identified during pre-clearing surveys

7 MONITORING

7.1 Environmental Monitoring

The timing of installation of control measures will be critical to ensuring that environmental obligations are met within the required timeframe and that controls are effective in achieving their purpose. A program of routine monitoring will be conducted on environmental controls.

Inspections of work areas by the Environmental Officer will provide a means for monitoring effectiveness of maintenance requirements before potential environmental impact occurs.

All post-construction monitoring will be undertaken in accordance with the approved specific management plans. Refer to the specified management plan for details.

Environmental monitoring will involve collecting and interpreting data to verify the compliance of the CEMP, and environmental mitigation measures employed for the construction phase of the project. The monitoring program will assist in the auditing of safeguard measures to ensure they achieve their objectives and to facilitate modification where necessary.

Monitoring results will be used to identify existing or potential problems, and where practical the results will be obtained at the time of the assessment. Where monitoring results do not meet the outlined criteria or accepted levels, a corrective action will be raised and followed up accordingly. All monitoring results and checklists will be filed and stored at the site office and recorded on the monitoring register, and where necessary sent to the according authority.

The Site Inspection Checklist is provided in Appendix G and will address the effectiveness of the environmental protection measures.

The methodology, frequency, timing and responsibilities for the proposed environmental monitoring programs are specified in each respective Management Plan. Where practical, a number of requirements from each Management Plan have been incorporated into the Weekly Site Inspection Checklist. Table 26 below outlines the monitoring frequencies from each Management Plan.

All inspection reports and non-conformances will be recorded in a centralised register (refer Appendix C and G) and acted on within two weeks, detailing the action taken or proposed, to address the issue.

Table 26: Monitoring

Monitoring Issue	Location	Frequency	Criteria	Person Responsible	Further Detail
Pre- Construction					
Fauna	Overall site	Already occurred – 2013/2014.	**Baseline Survey & Annual Survey:** The suite of native fauna (including threatened species) known to currently occupy the site continue to persist within identified habitat and Environmental Protection Areas on the site. Decreased abundance of pest species during annual fauna surveys as compared to baseline monitoring.	Ecologist (under direction of the Environmental Officer	Refer to F&FMP
	Overall site	Prior to the commencement of clearing.	Fauna protection fencing, erosion and sediment control and all other construction environment controls 100% intact and functional prior to clearing and construction (Appendix B).	Environmental Officer/Site Foreman	Refer to FMP
	SSPP	Within 12hrs prior to clearing	All hollows and other habitat features are inspected and flagged by the Fauna Spotter Catcher prior to clearing	Fauna Spotter Catcher/Environmental Officer	Refer to FMP
Flora	SSPP	Once, prior to clearing	High visibility exclusion netting, erosion and sediment control and all other construction environment controls remain 100% intact and functional prior to and during clearing and construction for effective protection of trees/vegetation/habitat/buffers to be retained (Appendix B).	Ecologist/Site Foreman	Refer to VMP.
		Prior to clearing	Vegetation protection measures included in the Environmental Induction and all workers inducted.	Environmental Officer	Refer to VMP.
Baseline Groundwater Water Quality Monitoring	Groundwater bores	Monthly	Data collected for pH, turbidity, suspended solids, salinity, dissolved oxygen, dissolved organic compounds, magnesium and calcium hardness and temperature in accordance with the Groundwater Management Plan (SMEC, 2012f).	Qualified ASS person	Refer to GMP (SMEC, 2012).
Acid Sulfate Soils	ASS identified areas	Once	One sample per 250m^3 collected to determine the net acidity and appropriate liming rate for the disturbed soil in the ASS risk area in accordance with the Acid Sulfate Soil Management Plan (SMEC, 2012a).	Qualified ASS person	Refer to Acid Sulphate Soils Management Plan (SMEC, 2012).

Monitoring Issue	Location	Frequency	Criteria	Person Responsible	Further Detail
Construction					
Fauna	Work areas	Daily	Erosion and sediment control and all other construction environment controls 100% intact and functional during construction.	Environmental Officer /Site foreman	Refer to FMP (SMEC, 2012).
	Work areas	Daily	Environmental Protection Areas and buffers are clearly marked and maintained for the duration of clearing and construction	Environmental Officer	Refer to FMP
	Work Areas	During all clearing and earthworks activities.	No injury or death of identified fauna during clearing and earthworks	Fauna Spotter Catcher	Refer to FMP
	Work Areas	Weekly general inspection, biweekly during substantial clearing	A general inspection completed for fencing associated with fauna. Rectifications reported and completed.	Environmental Officer	Refer to FMP
Flora	Work Areas	During clearing	All threatened flora and retained EEC's are buffered in accordance with the VMP.	Environmental Officer	Refer to VMP.
	Work Areas	During Clearing	• No clearing outside nominated clearing zones. • No clearing of or damage to threatened flora during construction. • No clearing of or damage to retained Endangered Ecological Communities.	Environmental Officer/Ecologist	Refer to VMP.
	Work Areas	During all clearing and earthworks activities	No alterations in drainage impacting on retained vegetation.	Environmental Officer	Refer to VMP.
Groundwater	Allocated bores	Monthly measurement of water levels, water quality testing and analysis of samples.	Water quality results are in compliance with the specified ANZECC guideline values for prescribed monitoring parameters.	Environmental Officer	Refer to Section 9.2 of the GMP (SMEC, 2012).
Surface Water Quality	Boards 1 to 4	Monthly	Water quality results are in compliance with the specified ANZECC guideline values for prescribed monitoring parameters.	Environmental Officer	Refer to Section 9.2 of the GMP (SMEC, 2012).
Groundwater during De-Watering	At any groundwater seepage into any	Daily water quality testing and sampling.	No increase in groundwater contamination in excess of pre-construction concentrations as a result of construction activities. Applicable groundwater	Environmental Officer	Refer to Section 9.2 of the GMP (SMEC, 2012).

Monitoring Issue	Location	Frequency	Criteria	Person Responsible	Further Detail
	excavation occurs		quality criteria include the: • ANZECC 2000 guideline values • Pre-construction levels		
Storm Water	Stormwater retention basis	Weekly/ 12 hourly during rainfall events (>25 mm)/ when pH is recorded < 6.5.	Water is of suitable quality that discharging runoff complies with the provisions of Council's Design Specification D7-Stormwater Quality, before being released.	Environmental Officer	Refer to Stormwater Management Plan (Yeats, 2012).
Contaminated Lands	Where potential for contamination is identified	Weekly	Controls implemented and effective.	Environmental Officer	Refer to GMP (Section 8.3) (SMEC, 2012).
Noise	Nearest possible location to likely affected residence or boundary of.	Reactive (complaint based)	Short term (4 weeks), LAeq, 15min, over a period of 15min. When construction is in operations must not exceed the background level by more than 20dB(A) at the boundary of the nearest likely affected residence. Long term (the duration) – LAeq, 15min, over a period of not less than 15min when construction is in operation, must not exceed the background level by more than 15dB(A) at the boundary of the nearest affected residence.	Environmental Officer	Refer to Section 6.1.10 of this plan.
Cultural Heritage	Entire site	As detected	Detection of Aboriginal objects or Aboriginal human remains reported and addressed.	Cultural Heritage Consultant	Refer to Cultural Heritage Management Plan (Everick, 2009).
Erosion and Sediment Control	Work Areas	Daily	Erosion and sediment controls are clean and functioning effectively according to design.	Environmental Officer/ Site foreman	Refer to Stormwater Management Plan (Yeats, 2012).
Air Quality	Work Areas	Daily	Visual observations for dust assessed, reported and managed. Zero complaints related to air quality.	Environmental Officer	Refer to Section 6.1.13 of this plan.
Acid Sulfate Soils	Where water has ponded	Twice Weekly	Testing undertaken for pH, turbidity and dissolved oxygen to determine ASS potential	Environmental Officer	Refer to Acid Sulphate Soils Management Plan

Monitoring Issue	Location	Frequency	Criteria	Person Responsible	Further Detail
					(SMEC, 2012).
	Following Liming	Once	One sample per 250m^3 and testing to ensure that treated soils have sufficient acid neutralising capacity and a pH > 5.5 and < 8.5	Qualified ASS person	Refer to Acid Sulphate Soils Management Plan (SMEC, 2012).
	Commencement of tyning and operations of final cut platforms	Once	One sample per 250m^3 and testing to ensure that treated soils have sufficient acid neutralising capacity and a pH > 5.5 and < 8.5	Qualified ASS person	Refer to Acid Sulphate Soils Management Plan (SMEC, 2012).
Waste	Work Areas	Daily inspection of receptacles. Monthly volumes of waste streams monitored.	Waste register is accurate and complete with all waste types (generated) identified Receptacles maintained at >75% capacity. No harm to environmental receptors.	Environmental Officer	Refer to Section 6.1.18 of this plan.
Traffic and Pedestrian Management	Work Areas	Daily inspection of washing facilities, road traffic and public access roads.	Evidence provided that all statutory responsibilities with regard to road traffic impacts have been complied with Public access roads remain clean and free of dirt and debris.	Environmental Officer	Refer to Section 6.1.9 of this plan.
Biting Midge and Mosquito Control	Surface waters	Weekly	Inspection for presence of mosquito larvae undertaken in accordance with the Biting Midge and Mosquito Control Management Plan (McGinn, 2008).	Ecologist	Refer to BM&MCMP (McGinn, 2008).

7.2 Environmental Auditing

Internal environmental audits will be conducted during construction. The first audit will be conducted three months after the commencement of construction and then at six monthly intervals. Areas of the project that may be audited include:

- Compliance with all regulatory requirements such as the conditions of approval;
- Compliance with the CEMP and relevant Management Sub Plans;
- Compliance with licences, permits and approvals;
- Progressive erosion and sediment control plans and implementation of the plans;
- Complaint response and procedures;
- Sub-contractors activities;
- Training records including inductions;
- Environmental non-conformances, corrective actions and close out procedures;
- Monitoring results;
- System documentation such as checklist completion;
- Major environmental controls used during construction and assess their effectiveness;
- Compliance with the main environmental Management Plans and processes implemented during construction and assess their effectiveness.
- Identify any innovations in construction methodology used to improve environmental management

The audit findings will be listed in an audit report and discussed with the Project Manager immediately following the audit. A copy of the audit report and findings will be submitted to Council. Corrective actions and opportunities for improvement identified will be managed by the Environmental Officer and the Project Manager for prompt implementation. Specific training may be required to personnel to close out the identified areas for improvement.

7.3 Corrective Action

Any environmental controls or measures that do not conform to specified requirements shall be actioned for rectification with a corrective action. Corrective actions will be recorded by the Environmental Officer in the Non-compliance and Corrective Actions Register (refer Appendix C) which will include the following information:

- Assigned responsibility for the person required to close out the corrective action
- Date required to be actioned by
- Photos if possible
- Description of non-conformance
- Location of non-conformance
- Date the corrective action was closed out.

8 REPORTING

8.1 Clearing & Earthworks Report

Given the potential time lapse between clearing and earthworks activities, the Post-Clearing and Earthworks Report will be completed in two stages. At the completion of clearing activities, the project ecologist/environmental officer in consultation with the fauna specialist will produce a Draft Stage 1 report providing a summary of the results of pre-clearing surveys, clearing operations and hollow relocations. A follow-up Stage 2 report will then be prepared to follow up on any additional issues that may have resulted from Earthworks activities. A separate Two-Stage report will be prepared for activities within each stage of construction.

Details within each report will include:

- Information on clearing and earthworks operations, dates, procedures, areas
- Details of habitat trees
- Information on tree species and tree sizes being used for breeding or roosting by fauna, including location, size, height and girth (i.e. for information base purpose).
- Detailed information about any incursion into no-go zones.
- Assessment against the performance criteria detailed in Section 8.
- Recommended remediation measures for any incursions into no-go zones.

Final reports will be submitted to TSC at the completion of Earthworks.

8.2 Compliance Report

In accordance with Condition 26c of MP08_0200, the Environmental Officer shall submit a Compliance Report to the Director General and Tweed Shire Council at the completion of each earthworks stage. The Compliance Report will be submitted within three weeks of the completion of each stage until the works have been completed under the authorised approvals. The Compliance Report will cover the following:

- How the project complied with relevant conditions, Management Plans and the CEMP; and
- Progress of construction on site.

8.3 Environmental Report

A written Environmental Report each month will be compiled by the Environmental Officer and included in the Project Monthly Report containing information obtained during weekly site inspections such as:

- A status of environmental activities such as monitoring and surveillance of controls, inspections and testing and incidents associated with the work during the preceding month;
- Complaints, infringements and penalties incurred;

- A status of environmental implementation and document preparation/approval;
- Status of all non-conformances and corrective actions; and
- The results of environment reviews and audits (Internal and external) undertaking during the preceding month.

8.4 Environmental Incident Notification

The Environmental Officer will prepare an incident report based on the incident register (refer Appendix E), which will be recorded, distributed to the appropriate authorities (where necessary) and to the Project Manager, and stored on site. The report shall include the following:

- Contributing factors, e.g. how / why
- Severity classification
- Rectification actions
- Notification requirements.

8.5 Maintenance of Records

The following records will be maintained throughout the project:

- The CEMP (all versions)
- Regulatory licences and permits
- Correspondence with regulatory authorities
- Monitoring results
- Employee induction and training records
- Erosion and sediment control inspection lists
- Environmental accidents/incidents/emergency reports
- Non-conformances and corrective actions lists
- Compliance reports
- Post Clearing report
- Complaints report
- Waste reports
- Audit reports/results
- Any relevant reports submitted to regulatory agencies
- Management review minutes and action taken

Records will be held for at least 5 years after the date of Final Completion and made accessible to authorised regulatory agencies.

8.6 Document & Data Control

During construction it is expected that the environmental documents will be stored at the main site office and will be available on request to regulatory authorities. A register and distribution list will be maintained which will identify the current revision of particular documents or data.

9 CEMP REVIEW

The CEMP and its operations and implementation will be reviewed every 6 months or otherwise appropriate during the construction phase of the project by the Project Manager and Environmental Officer. Between scheduled reviews, a register of issues will be maintained to ensure that any issued raised by internal and external personnel associated with the project is recorded and not overlooked.

The purpose of the review is to ensure that the system is meeting the requirements of the standards, policies and objectives. The review will consider:

- Comments from construction personnel and relevant government agencies;
- Inspection, monitoring and audit findings;
- Complaints;
- Details of corrective and preventative actions taken;
- Environmental non-conformances and corrective actions;
- Incident reports;
- Changes in organisational structures and responsibilities;
- The extent of compliance with objectives and targets;
- Changes in legislation, regulations and standards;
- Co-ordination of environmental management of sub-contractors.

Any amendments to the CEMP will be communicated to site personnel by way of training, toolbox or notification by email, dependant on the changes made. A copy of the amended CEMP will be submitted to Tweed Shire Council for approval.

REFERENCES

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SMEC. 2013a. Flora and Fauna Monitoring Program

SMEC, 2013b. Long Nosed Potoroo Management Plan

SMEC, 2014. Acid Sulfate Soils Management Plan

Yeats. 2010a. Stormwater Quality Concept Plan

Yeats. 2010b. Construction Environmental Management Plan – Statement of Intent

Yeats 2011. Erosion and Sediment Control Plan Drawings

APPENDIX A – BULK EARTHWORKS DRAWINGS

DRAWING INDEX

DWG. No.	DESCRIPTION	REVISION
YC0229-1E1-D01	COVER SHEET & LOCALITY PLAN	D
YC0229-1E1-D02	INDEX SHEET	H
YC0229-1E1-D03	SCOPE OF WORKS & KEY SHEET PLAN	G
YC0229-1E1-D04	MISSING LINK CONSTRUCTION STAGING PLAN	C
YC0229-1E1-A01	ALIGNMENT DETAILS - SHEET 1 OF 2	D
YC0229-1E1-A02	ALIGNMENT DETAILS - SHEET 2 OF 2	C
YC0229-1E1-E01	EROSION & SEDIMENT CONTROL PLAN - SHEET 1 OF 2	G
YC0229-1E1-E02	EROSION & SEDIMENT CONTROL PLAN - SHEET 2 OF 2	E
YC0229-1E1-E03	SEDIMENT BASIN SETOUT DETAILS - SHEET 1 OF 3	C
YC0229-1E1-E04	SEDIMENT BASIN SETOUT DETAILS - SHEET 2 OF 3	C
YC0229-1E1-E05	SEDIMENT BASIN SETOUT DETAILS - SHEET 3 OF 3	A
YC0229-1E1-EC01	BULK EARTHWORKS CUT / FILL PLAN - SHEET 1 OF 2	H
YC0229-1E1-EC02	BULK EARTHWORKS CUT / FILL PLAN - SHEET 2 OF 2	F
YC0229-1E1-EW01	BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 8	F
YC0229-1E1-EW02	BULK EARTHWORKS LAYOUT PLAN - SHEET 2 OF 8	F
YC0229-1E1-EW03	BULK EARTHWORKS LAYOUT PLAN - SHEET 3 OF 8	E
YC0229-1E1-EW04	BULK EARTHWORKS LAYOUT PLAN - SHEET 4 OF 8	E
YC0229-1E1-EW05	BULK EARTHWORKS LAYOUT PLAN - SHEET 5 OF 8	E
YC0229-1E1-EW06	BULK EARTHWORKS LAYOUT PLAN - SHEET 6 OF 8	E
YC0229-1E1-EW07	BULK EARTHWORKS LAYOUT PLAN - SHEET 7 OF 8	E
YC0229-1E1-EW08	BULK EARTHWORKS LAYOUT PLAN - SHEET 8 OF 8	E
YC0229-1E1-EW09	PRECINCT 1 & 2 BORROW AREA EARTHWORKS PLAN - SHEET 1 OF 4	C
YC0229-1E1-EW10	PRECINCT 1 & 2 BORROW AREA EARTHWORKS PLAN - SHEET 2 OF 4	C
YC0229-1E1-EW11	PRECINCT 1 & 2 BORROW AREA EARTHWORKS PLAN - SHEET 3 OF 4	C
YC0229-1E1-EW12	PRECINCT 1 & 2 BORROW AREA EARTHWORKS PLAN - SHEET 4 OF 4	C
YC0229-1E1-EW13	PRECINCT 9 BORROW AREA EARTHWORKS PLAN	C
YC0229-1E1-EW14	PRECINCT 11 BORROW AREA EARTHWORKS PLAN	A
YC0229-1E1-ES01	BULK EARTHWORKS SECTIONS - SHEET 1 OF 2	D
YC0229-1E1-ES02	BULK EARTHWORKS SECTIONS - SHEET 2 OF 2	E
YC0229-1E1-ES03	BULK EARTHWORKS TYPICAL SECTIONS	D
YC0229-1E1-ES04	PRECINCT 1 & 2 BORROW AREA EARTHWORKS SECTIONS - SHEET 1 OF 4	D
YC0229-1E1-ES05	PRECINCT 1 & 2 BORROW AREA EARTHWORKS SECTIONS - SHEET 2 OF 4	D
YC0229-1E1-ES06	PRECINCT 1 & 2 BORROW AREA EARTHWORKS SECTIONS - SHEET 3 OF 4	D
YC0229-1E1-ES07	PRECINCT 1 & 2 BORROW AREA EARTHWORKS SECTIONS - SHEET 4 OF 4	D
YC0229-1E1-ES08	PRECINCT 9 BORROW AREA EARTHWORKS SECTIONS	D
YC0229-1E1-ES09	PRECINCT 11 BORROW AREA EARTHWORKS SECTIONS	A
YC0229-1E1-DL01	MAJOR CENTRAL OPEN DRAIN LONGITUDINAL SECTION - SHEET 1 OF 3	D
YC0229-1E1-DL02	MAJOR CENTRAL OPEN DRAIN LONGITUDINAL SECTION - SHEET 2 OF 3	D
YC0229-1E1-DL03	MAJOR CENTRAL OPEN DRAIN LONGITUDINAL SECTION - SHEET 3 OF 3	D
YC0229-1E1-XS01	MAJOR CENTRAL OPEN DRAIN CROSS SECTIONS - SHEET 1 OF 10	D
YC0229-1E1-XS02	MAJOR CENTRAL OPEN DRAIN CROSS SECTIONS - SHEET 2 OF 10	D
YC0229-1E1-XS03	MAJOR CENTRAL OPEN DRAIN CROSS SECTIONS - SHEET 3 OF 10	D
YC0229-1E1-XS04	MAJOR CENTRAL OPEN DRAIN CROSS SECTIONS - SHEET 4 OF 10	D
YC0229-1E1-XS05	MAJOR CENTRAL OPEN DRAIN CROSS SECTIONS - SHEET 5 OF 10	D
YC0229-1E1-XS06	MAJOR CENTRAL OPEN DRAIN CROSS SECTIONS - SHEET 6 OF 10	D
YC0229-1E1-XS07	MAJOR CENTRAL OPEN DRAIN CROSS SECTIONS - SHEET 7 OF 10	D
YC0229-1E1-XS08	MAJOR CENTRAL OPEN DRAIN CROSS SECTIONS - SHEET 8 OF 10	D

DRAWING INDEX

DWG. No.	DESCRIPTION	REVISION
YC0229-1E1-XS09	MAJOR CENTRAL OPEN DRAIN CROSS SECTIONS - SHEET 9 OF 10	D
YC0229-1E1-XS10	MAJOR CENTRAL OPEN DRAIN CROSS SECTIONS - SHEET 10 OF 10	D
YC0229-1E1-DL04	MINOR OPEN DRAIN 4 LONGITUDINAL SECTION	D
YC0229-1E1-XS11	MINOR OPEN DRAIN 4 CROSS SECTIONS SHEET 1 OF 2	D
YC0229-1E1-XS12	MINOR OPEN DRAIN 4 CROSS SECTIONS SHEET 2 OF 2	D
YC0229-1E1-DL05	MINOR OPEN DRAIN 5 LONGITUDINAL SECTION	E
YC0229-1E1-XS13	MINOR OPEN DRAIN 5 CROSS SECTIONS SHEET 1 OF 1	C
YC0229-1E1-XS14	MINOR OPEN DRAIN 5 CROSS SECTIONS SHEET 2 OF 3	C
YC0229-1E1-XS15	MINOR OPEN DRAIN 5 CROSS SECTIONS SHEET 3 OF 3	C
YC0229-1E1-DL06	MINOR OPEN DRAIN 6 LONGITUDINAL SECTION	D
YC0229-1E1-XS16	MINOR OPEN DRAIN 6 CROSS SECTION SHEET 1 OF 2	D
YC0229-1E1-XS17	MINOR OPEN DRAIN 6 CROSS SECTION SHEET 2 OF 2	D
YC0229-1E1-DL07	MINOR OPEN DRAIN 7 LONGITUDINAL SECTION	D
YC0229-1E1-XS18	MINOR OPEN DRAIN 7 CROSS SECTION SHEET 1 OF 3	D
YC0229-1E1-XS19	MINOR OPEN DRAIN 7 CROSS SECTION SHEET 2 OF 3	D
YC0229-1E1-XS20	MINOR OPEN DRAIN 7 CROSS SECTION SHEET 3 OF 3	D
YC0229-1E1-DL08	MINOR OPEN DRAIN 1 LONGITUDINAL SECTION	C
YC0229-1E1-CL01	COBAKI PARKWAY LONGITUDINAL SECTION	C
YC0229-1E1-CX01	COBAKI PARKWAY CROSS SECTIONS - SHEET 1 OF 7	C
YC0229-1E1-CX02	COBAKI PARKWAY CROSS SECTIONS - SHEET 2 OF 7	C
YC0229-1E1-CX03	COBAKI PARKWAY CROSS SECTIONS - SHEET 3 OF 7	C
YC0229-1E1-CX04	COBAKI PARKWAY CROSS SECTIONS - SHEET 4 OF 7	C
YC0229-1E1-CX05	COBAKI PARKWAY CROSS SECTIONS - SHEET 5 OF 7	C
YC0229-1E1-CX06	COBAKI PARKWAY CROSS SECTIONS - SHEET 6 OF 7	C
YC0229-1E1-CX07	COBAKI PARKWAY CROSS SECTIONS - SHEET 7 OF 7	C
YC0229-1E1-SL01	SANDY ROAD LONGITUDINAL SECTION - SHEET 1 OF 2	D
YC0229-1E1-SL02	SANDY ROAD LONGITUDINAL SECTION - SHEET 2 OF 2	D
YC0229-1E1-SX01	SANDY ROAD CROSS SECTIONS - SHEET 1 OF 7	D
YC0229-1E1-SX02	SANDY ROAD CROSS SECTIONS - SHEET 2 OF 7	D
YC0229-1E1-SX03	SANDY ROAD CROSS SECTIONS - SHEET 3 OF 7	D
YC0229-1E1-SX04	SANDY ROAD CROSS SECTIONS - SHEET 4 OF 7	D
YC0229-1E1-SX05	SANDY ROAD CROSS SECTIONS - SHEET 5 OF 7	D
YC0229-1E1-SX06	SANDY ROAD CROSS SECTIONS - SHEET 6 OF 7	C
YC0229-1E1-SX07	SANDY ROAD CROSS SECTIONS - SHEET 7 OF 7	C
YC0229-1E1-TS01	COBAKI PARKWAY & SANDY ROAD TYPICAL CROSS SECTIONS	E
YC0229-1E1-SW01	CULVERT 'A' LOCATION & DETAILS - SHEET 1 OF 2	C
YC0229-1E1-SW02	CULVERT 'A' LOCATION & DETAILS - SHEET 2 OF 2	C
YC0229-1E1-SW03	CULVERT 'B' LOCATION & DETAILS	C
YC0229-1E1-SW04	CULVERT 'C' LOCATION & DETAILS	C
YC0229-1E1-SW05	LOW FLOW DIVERSION BUND LAYOUT PLAN	C
YC0229-1E1-SW06	CENTRAL OPEN SPACE DRAINAGE INTERSECTION DETAILS - SHEET 1 OF 2	D
YC0229-1E1-SW07	CENTRAL OPEN SPACE DRAINAGE INTERSECTION DETAILS - SHEET 2 OF 2	D

T.S.C. REFERENCE DRAWINGS

DWG. No.	DESCRIPTION
S.D.501	EROSION & SILTATION PREVENTION DEVICES SHEET 1
S.D.502	EROSION & SILTATION PREVENTION DEVICES SHEET 2

INSTITUTION OF ENGINEERS, AUSTRALIA GUIDELINES

DESCRIPTION
SOIL EROSION & SEDIMENT CONTROL - ENGINEERING GUIDELINES FOR QUEENSLAND CONSTRUCTION SITES - JUNE 1996

ROADS AND TRAFFIC AUTHORITY, NSW

DWG. No.	DESCRIPTION
MD.R11.A01.A.2	INSTALLATION, BEDDING AND FILLING/BACKFILLING AGAINST/OVER CONCRETE PIPE CULVERTS

QUEENSLAND GOVERNMENT DEPARTMENT OF TRANSPORT AND MAIN ROADS

DWG. No.	CATEGORY	DESCRIPTION
1131	RC SLAB DECK CULVERT - 2500 SPAN	CONSTRUCTION OF FOUNDATIONS, APRONS WALLS AND WINGS
1303	RC BOX CULVERTS & SLAB LINK BOX CULVERTS	CONSTRUCTION OF REINFORCED CONCRETE WINGWALLS AND HEADWALLS
1305	ENDS TO PIPE CULVERTS	GENERAL ARRANGEMENT AND INSTALLATION OF WINGWALLS, HEADWALLS AND APRONS
1318	RC BOX CULVERTS & SLAB LINK BOX CULVERTS	CONSTRUCTION OF BASES WITH RECESSES AND APRONS
1319	RC BOX CULVERTS & SLAB LINK BOX CULVERTS	CONSTRUCTION OF UNREINFORCED WINGWALLS AND RC HEADWALLS H = 750 - 2400

STATUS: CONSTRUCTION CERTIFICATE — FOR APPROVAL

REV	DESCRIPTION	DRAWN	DATE
H	ADDITIONAL FILL ZONE TO SSPP (MP08_0200 Mod 3)	C.S.	30.06.14
G	RESPONSE TO TSC COMMENTS (RE: MP08_0200 Mod 2)	C.S.	10.03.14
F	PRECINCT 9 AND PRECINCT 11 BORROW AREAS ADDED	M.B.	11.12.13
E	MINOR OPEN DRAIN 5 ADDED TO DRAWING SET	T.W.	02.10.13
D	BULK EARTHWORKS CONSTRUCTION CERTIFICATE(RFI)	M.G.	15.02.13
C	RESPONSE TO 3rd PARTY SWMP REVIEW	H.W.	04.05.12

DRAWING IS NOT TO BE SCALED

SCALE (AT ORIGINAL SHEET SIZE): N/A

ORIGINAL SHEET SIZE: A1

CLIENT: LEDA MANORSTEAD Pty Ltd

LEDA

PROJECT:
COBAKI, TWEED HEADS WEST
CENTRAL OPEN SPACE
BULK EARTHWORKS
CONSTRUCTION CERTIFICATE
CIVIL ENGINEERING DRAWINGS

SEDGMAN YEATS
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TITLE: INDEX SHEET

TASK	BY	INITIAL	DATE
REVIEW	CS		18.03.11
DESIGN	CJE		18.03.11
DRAWN	GS		18.03.11

APPROVED — RPEQ No

DRAWING NUMBER: YC0229-1E1-D02 — REVISION: H

YC0229-1E1-02_D02_INDEX SHEET.dwg 11.07.2014 ANSI A (8.50 x 11.00 Inches) None Michael Binge