


Leda Manorstead Pty Ltd

Cobaki Estate
Development Precincts 1 & 2
Bulk Earthworks

Environmental Assessment Report

Revision 1
February 2013

engineering | planning | environmental | water management | urban design | project management | landscape architecture

Project Name:	Cobaki Precincts 1 and 2 Earthworks Environmental Report
Project Number:	3003773
Report for:	Leda Manorstead Pty Ltd

PREPARATION, REVIEW AND AUTHORISATION

Revision #	Date	Prepared by	Reviewed by	Approved for Issue by
1	15/01/2013	A Marsden	J Alexander	J Alexander

ISSUE REGISTER

Distribution List	Date Issued	Number of Copies
Tweed Shire Council:		
LEDA Manorstead Pty Ltd	07/02/2013	1
SMEC staff:		
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1 INTRODUCTION

This Environmental Assessment has been prepared by SMEC Pty Ltd for LEDA Manorstead Pty Ltd and relates to the impacts of works which have been undertaken in Development Precincts 1 and 2 of the proposed Cobaki Estate development. The Cobaki Estate development is located within Tweed Shire Council and is a proposed new residential community with a mix of urban land uses integrated with open space and environmental protection areas.

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 Precincts 1 and 2. Precincts 1 and 2 occur in the north-western portion of the Cobaki site and consist of land described as Lot 199 on DP755740, Lot 200 on DP755740, Lot 201 on DP755740 and Lot 202 on DP755740. Precinct 1 covers a total area of approximately 13.6 ha and will be comprised of 206 residential lots. Precinct 2 covers an area of 18.6 ha and will be comprised of 269 residential lots and one residual lot of approximately 3.8 ha.

The location of Development Precincts 1 and 2 with respect to the Cobaki site is shown in Figure 1.

1.2 Scope

Queries regarding the legality of bulk earthworks recently undertaken within Precincts 1 and 2 have raised concerns regarding potential environmental impacts and management of the area to minimise impact.

On 17th December 2012 LEDA Manorstead applied for an amendment to the current modification application for the Cobaki Estate Central Open Space Project Approval (08_0200 Mod 1) for the winning of fill from Precincts 1 and 2 for construction of the Central Open Space (as approved under 08_0200).

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

Figure 1: Site Locality

COORDINATE SYSTEM
GDA 1994 MGA Zone 56

0 1 2km

Scale: 1: 30,000 @ A4

FIGURE 1 - Site Locality REVISION 0 STATUS FINAL

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1.3 Previous Studies

A number of previous studies have been undertaken and management plans prepared as part of the various stages of development approval for this proposed development. Thesehave been reviewed as part of this assessment.

0Studies and Plans reviewed as part of this report include, but are not limited to:

- Environmental Assessment Report Part 3A Concept Plan (JBA Urban Planning, 2008);
- Environmental Assessment Report Part 3A Project Application (JBA Urban Planning, 2009);
- Ecological Assessment – Volume 1 (James and Warren & Associates, 2008a);
- Vegetation Management Plan (James and Warren & Associates, 2008b);
- Fauna Management Plan (James and Warren & Associates, 2009);
- Ecological Assessment Precinct 1 & 2 (James and Warren & Associates, 2010a);
- Ecological Assessment Precinct 6 (James and Warren & Associates, 2010b);
- Revised Regeneration and Revegetation Plan (James and Warren & Associates, 2010c);
- Stormwater Quality Concept Plan (Yeats, 2010a);
- Construction Environmental Management Plan – Statement of Intent (Yeats, 2010b);
- Long Nosed Potoroo Management Plan (SMEC, 2011);
- Acid Sulphate Soils Management Plan (SMEC, 2012a);
- Buffer Management Plan – Central Open Space and Precincts 1, 2 & 6 (SMEC, 2012b);
- Fauna Management Plan – Central Open Space and Precincts 1, 2 & 6 (SMEC, 2012c);
- Groundwater Management Plan – Central Open Space and Precincts 1, 2 & 6 (SMEC, 2012d);
- Flora and Fauna Monitoring Program (SMEC, 2012e);
- Site Regeneration and Rehabilitation Management Plan – Central Open Space and Precincts 1, 2 & 6 (SMEC, 2012f).
- Vegetation Management Plan – Central Open Space and Precincts 1, 2 & 6 (SMEC, 2012g);

The various management plans have specific management measures, monitoring and reporting requirements that must be implemented as per the various conditions of approval relating to this proposed development.

2 APPROVALS AND LICENSING

The legislative requirements, policies, guidelines and standards relevant to the project are summarised in Table 1.

Table 1: Environmental Legislation Relevant to the Project

Legislation	Details of Approvals/Permits Required	Relevance to the Project
Commonwealth		
Environmental Protection and Biodiversity Act 1999 (EPBC)	The EPBC Act requires that actions that are proposed to be taken which are likely to have a significant impact on matters of national environmental significance (NES) are referred to the Minister for a decision on if it will be subject to a rigorous assessment and approval process. The EPBC Act also applies to actions that are likely to have a significant impact on the environment of Commonwealth land and to actions taken by the Commonwealth that will have a significant impact on the environment anywhere.	The Minister of SEWPaC provided approval of the development on 13th October 2011, subject to a list of conditions, including Condition 2, which states that a Management Plan for the Long-nosed Potoroo is to be submitted to the Minister of SEWPaC for approval.
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 title. The Act was substantially amended in 1998. The	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
	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, MP08_0200 and DA10/0800 & DA10/0801 to ensure the long term protection of such species/communities.
National Parks and 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"). 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).	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: • 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. In the case of a Part 3A Concept Plan, approval under the NPW Act is not required.

Legislation	Details of Approvals/Permits Required	Relevance to the Project
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 POTENTIAL ENVIRONMENTAL IMPACTS

Given that as part of the disputed works, clearing and some bulk earthworks have already occurred, this section focuses on the potential impacts associated with future borrow works. The Precincts 1 and 2 borrow areas are shown in Figure 2.

Construction activities associated with the earthworks within the borrow areas of Precincts 1 and 2 include:

- Installation of 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).

Works could potentially impact on the following environmental aspects:

- Native Fauna and habitat (indirectly);
- Native and threatened flora and Endangered Ecological Communities (indirectly);
- Groundwater quality;
- Surface water quality;
- Air quality; and
- Cultural heritage.

3.1 Impacts to native fauna and habitat

Precincts 1 and 2 bulk earthworks will not involve the removal of any potential habitat for native fauna species. Activities associated with the cut of precincts 1 & 2 borrow areas have the potential to indirectly affect fauna and habitats through:

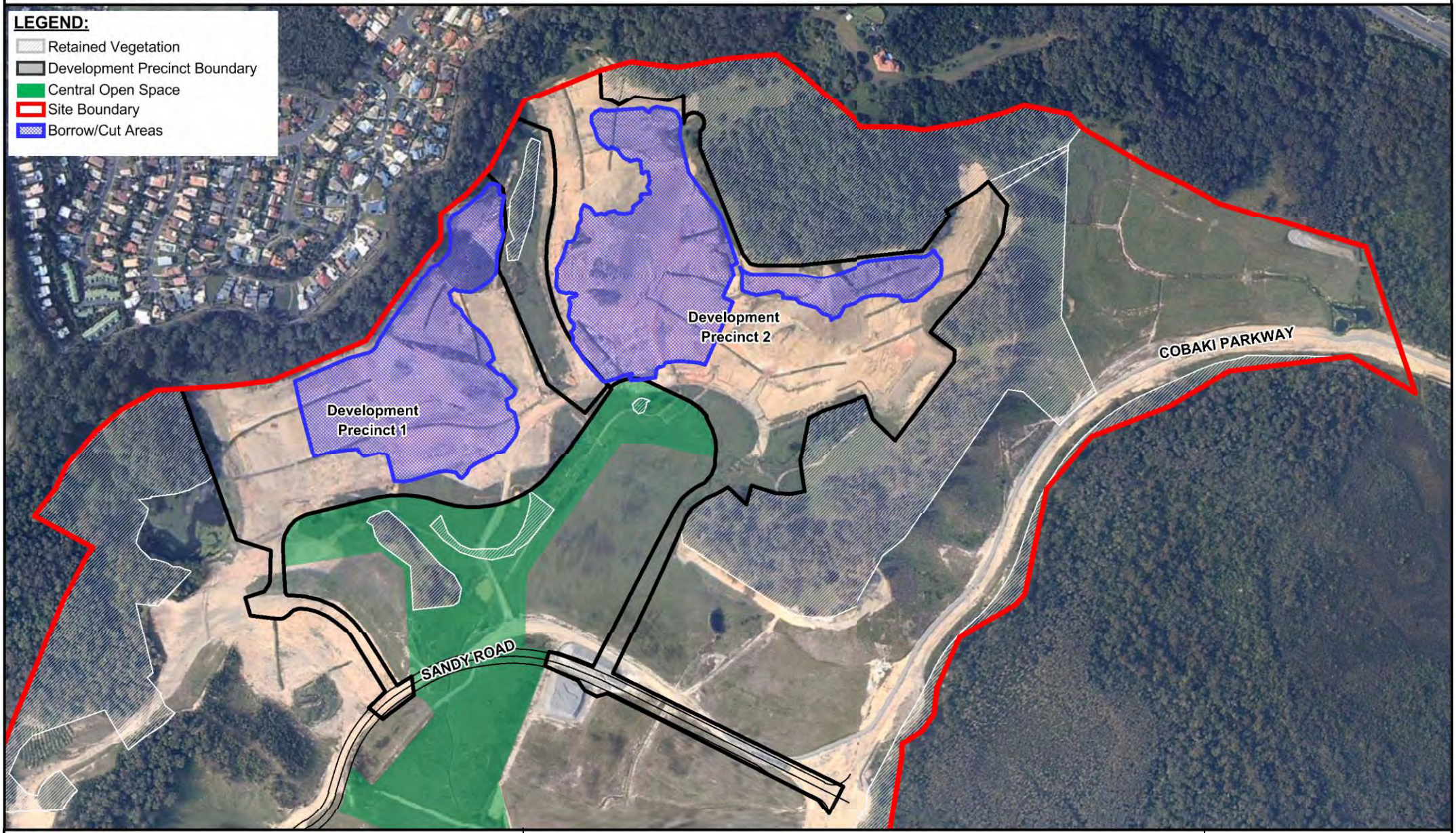
- Mortality and loss of habitat (foraging, breeding, and roosting/nesting) due to changes in land use (vehicle strike, trampling, spills, dumping of waste); and
- Habitat degradation due to alteration of natural hydrological regimes and increases in pollutants.

Nine (9) threatened fauna species have been recorded adjacent to Precincts 1 and 2, as detailed in **Table 2** and **Figure 3**.

Table 2: Threatened fauna species and or habitat within or adjacent to Precincts 1 and 2

Common name	Scientific name	Status	Act	Precinct location	
				1	2
Masked owl	*Tyto novaehollandiae*	Vulnerable	TSC Act		
Grey-headed flying fox	*Pteropus poliocephalus*	Vulnerable	EPBC Act		
Osprey	*Pandion haliaetus*	Vulnerable	TSC Act		
Little bent-wing bat	*Miniopterus australis*	Vulnerable	TSC Act		
Common bent-wing bat	*Miniopterus schreibersii*	Vulnerable	TSC Act		
Yellow-bellied sheathtail bat	*Saccolaimus flaviventris*	Vulnerable	TSC Act		
Greater broad-nosed bat	*Scoteanax rueppelli*	Vulnerable	TSC Act		
Eastern free-tail bat	*Mormopterus norfolkensi*	Vulnerable	TSC Act		
Powerful owl	*Ninox strenua*	Vulnerable	TSC Act		

Figure 2: Precincts 1 & 2 Borrow Areas



COORDINATE SYSTEM
GDA 1994 MGA Zone 56

0 200 400m
Scale: 1 : 8,000 @ A4

FIGURE 2 - Borrow Areas **REVISION** 0 **STATUS** FINAL

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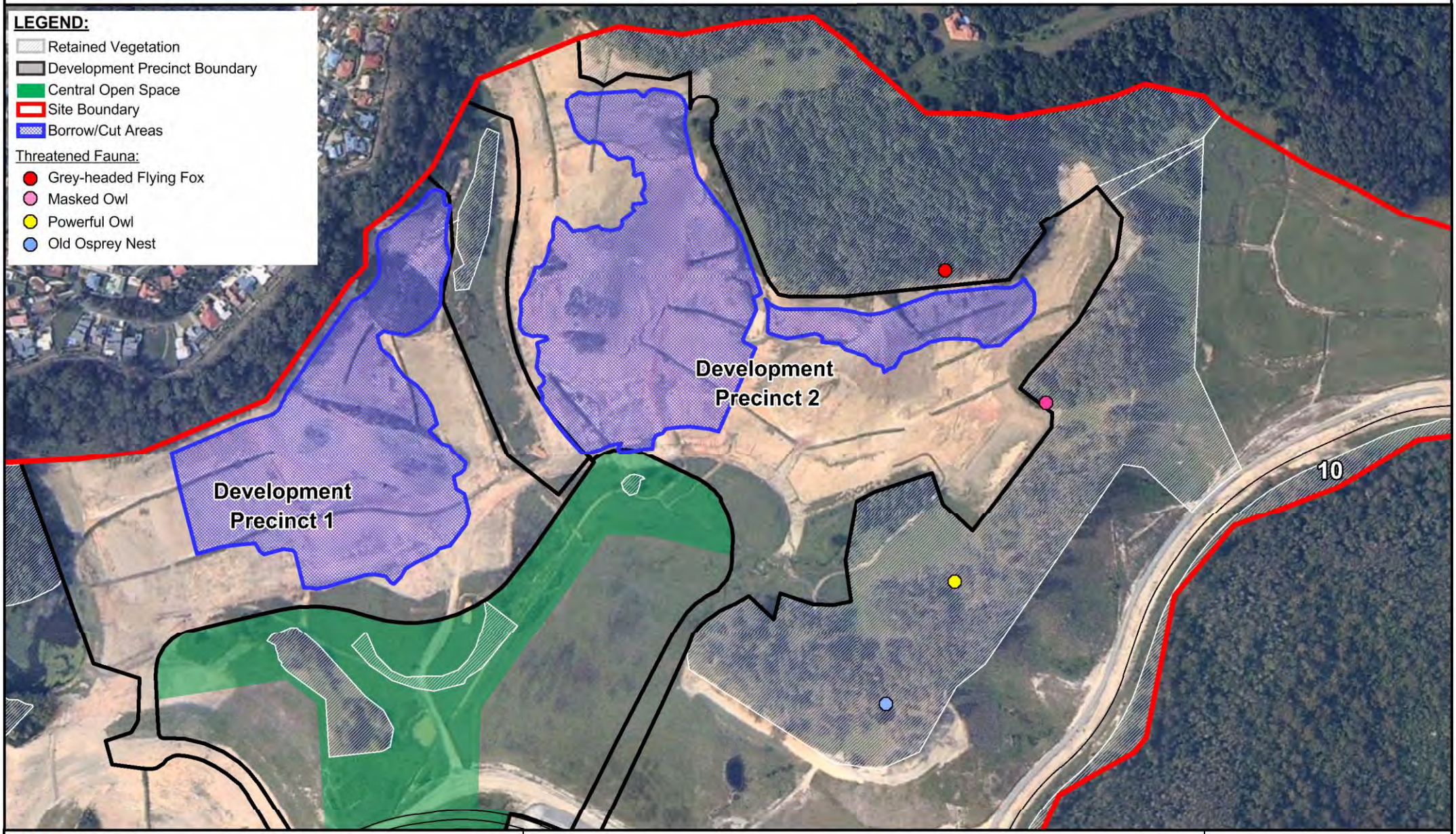
Figure 3: Fauna Records



COORDINATE SYSTEM GDA 1994 MGA Zone 56	0 200 400m Scale: 1 : 6,000 @ A4	**FIGURE** 3 - Fauna Records	**REVISION** 0	**STATUS** FINAL
		CREATED BY AM11482	**DATE** 29/01/2013	**ISSUED FOR INFORMATION**
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The Bulk earthworks within Precincts 1 and 2 Borrow Areas are highly unlikely to impact on these species.

Additionally, while no individuals or potential habitat for the Long-nosed Potoroo (*Potorous tridactylus tridactylus)* has been identified within Cobaki Estate development site, the species has been recorded adjacent to the north eastern corner of the site (Warren, 1994; Woodward-Clyde, 1997). Currently construction workers are accessing the site via Piggabean Road on the south of the site. However, if contractors are to access the site via Boyd Street, which is in close vicinity to the Long-nosed Potoroo population,potential impacts to the local population of Long-nosed Potoroo (Endangered, *EPBC Act*) must be managed.

Specific management measures associated with these impacts are detailed in Section 4.

3.2 Impacts to Native Vegetation

Precincts 1 and 2 future bulk earthworks will not involve the removal of any native vegetation. Activities associated with earthworks of the precincts 1 & 2 borrow areas have the potential to indirectly affect adjacent native vegetation through introduction of weeds, sediment flow and alteration of hydrology regimes. However, with implementation of the actions contained within the environmental management and rehabilitation plans proposed for the area, the likelihood of significant impact on adjacent native vegetation is considered low.

3.2.1 Threatened Flora Species

Flora surveys undertaken by James Warren and Associates (2008) recorded the presence of six (6) threatened flora species listed under the TSC Act in areas adjacent to Precincts 1 and 2.

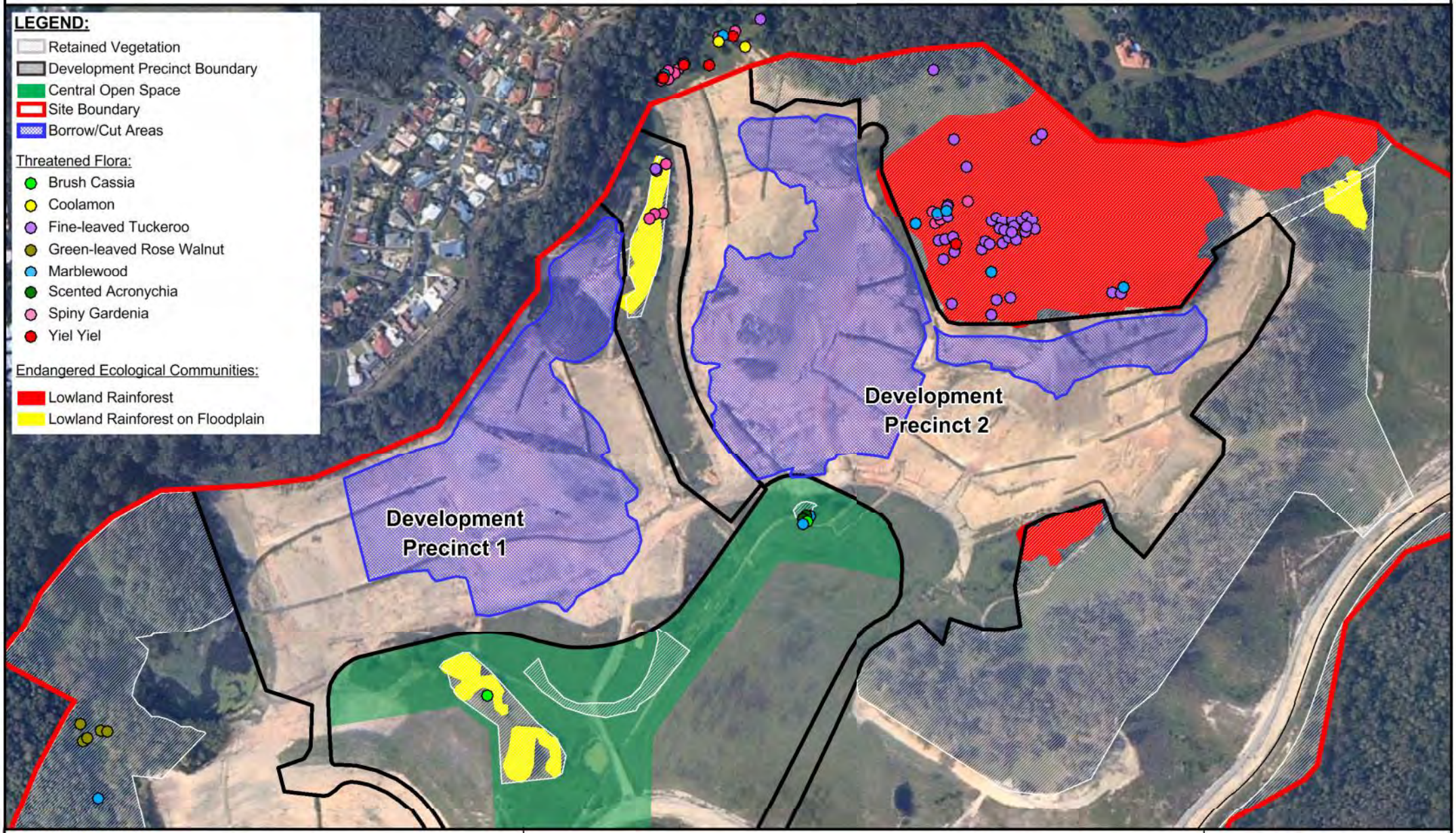
Table 3 – Threatened Flora adjacent to Precincts 1 and 2

Common name	Species name	Conservation Status		Adjacent to Precinct
		TSC	EPBC	
Fine-leaved Tuckeroo	*Lepiderema pulchella*	Vulnerable		1 & 2
Spiny Gardenia	*Randia moorei*	Endangered	Endangered	1 & 2
Marblewood	*Acacia bakeri*	Vulnerable		1 & 2
Coolamon	*Syzygium moorei*	Vulnerable	Vulnerable	2
Green-leaved Rose Walnut	*Endiandra muelleri subsp. bracteata*	Endangered		1
Yiel Yiel	*Grevillea hilliana*	Endangered		2

No Threatened flora species, or their habitat, will be removed as a result of the bulk earthworks associated with the Precincts 1 & 2 borrow areas.

Location of threatened flora is shown in Figure 4.

Figure 4: Threatened Flora Records and Endangered Ecological Communities



COORDINATE SYSTEM GDA 1994 MGA Zone 56	0 200 400m Scale: 1 : 6,000 @ A4	FIGURE 4 - Flora & EECs	REVISION 0	STATUS FINAL
		CREATED BY AM11482	DATE 29/01/2013	ISSUED FOR INFORMATION

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3.2.2 Endangered Ecological Communities (EEC's)

Two (2) Endangered Ecological Communities (EEC) listed under Schedule 1 of the TSC Act have been recorded adjacent to Precincts 1 and 2: Lowland rainforest and Lowland rainforest on floodplain.

The location of these Endangered Ecological Communities is shown in Figure 4.

Lowland Rainforest

This EEC occurs on Mt. Woodgee and associated slopes in the northern portion of the site and covers a total area of approximately 9.24 hectares. Vegetation of this type on Mt. Woodgee is relatively intact and is considered to represent one of the most ecologically significant vegetation communities on the site, particularly in terms of habitat value for existing Threatened flora species.

Precincts 1 and 2 bulk earthworks will not involve the removal of any Lowland Rainforest. Further, the Lowland Rainforest community adjacent to the borrow areas within Precinct 2 is at a higher elevation than the Precinct, and as such any runoff from the proposed works will not impact on this community. The proposed works are highly unlikely to result in any impacts on this endangered ecological community.

Lowland Rainforest on Floodplain

This vegetation type generally occurs in association with drainage lines and depressions (i.e. riparian forest). A 0.49-hectare patch of Lowland Rainforest on Floodplain is located within a Rehabilitation and Management Area east of Development Precinct 1 (Figure 4). The conservation significance of this vegetation type on the site has been compromised by historical clearing activities and ongoing grazing activities resulting in fragmentation and degradation, especially within the isolated patches and edges of more extensive areas.

Precincts 1 and 2 bulk earthworks will not involve the removal of any Lowland Rainforest on Floodplain. Potential impacts would be limited to runoff due to poorly managed sediment erosion control around the adjacent bulk earthworks borrow areas. However, with implementation of the actions contained within the environmental management and rehabilitation plans proposed for the area, the likelihood of significant impact on adjacent native vegetation is considered low.

3.3 Impacts on Groundwater

There are potential impacts to groundwater as a result of the proposed works, namely:

- Impacts on the pre-development groundwater flow regimes as a result of excavation
- Impacts on groundwater quality as a result of chemical/oil spills during works

- Excavation causes soil disturbance, which can alter the permeability of the subsurface and the groundwater recharge regime. Reduction in the depth to groundwater may shorten the pathway to the watertable for any surface contaminants, making the groundwater system more vulnerable to pollution.

Based on bulk earthworks drawings (Appendix A) and groundwater contours derived for the site, no interception of groundwater is anticipated within the bulk earthworks borrow areas. Therefore, no significant impact on groundwater is likely.

The cut and fill extents are summarised in the plans in Appendix A.

3.3.1 Disturbance of ASS

Generally impacts associated with ASS on the overall site are limited to the low lying Central Open Space where the water table is shallow. Earthworks proposed for Precincts 1 and 2 is mostly in the elevated areas where the ASS is unlikely to be disturbed and where groundwater is deeper and unlikely to be intercepted. Management procedures in regards to ASS are contained within the ASSMP for the project (SMEC, 2012) and Section 4.4.

3.3.2 Contamination

No recognised contaminated sites area present with Precincts 1 and 2. During construction potential spillage of dangerous goods and hazardous chemicals could result in contamination of groundwater.

Key issues relating to contaminated groundwater (existing and potential) include:

- Risks to human health and the environment
- Contaminated groundwater migration

3.3.3 Dewatering

No dewatering is planned as part of the proposed bulk earthworks.

Based on earthworks drawings (Appendix A) and groundwater contours derived for the site, excavation activities may intercept groundwater at the north-south swale adjacent to proposed Road No. 10 – cutting along length of swale to RLs between 2.617 and 3.836 m AHD. However, this swale is not part of the bulk earthworks borrow areas, and will not be impacted by the currently proposed works.

3.4 Noise and Vibration

Construction activities may produce some level of noise emissions causing disturbance to local residents and other land users.

Due to the nature of construction work, noise levels will vary and are dependent on:

- the location and proximity of plant equipment to each other and to sensitive receptors; and
- the type of work being undertaken at any given time and whether work involves all machinery operating at the maximum sound power levels.

The nearest sensitive receptors to the proposed works are residences on Ajax Court and Sawtell Drive, Currumbin Waters. These residences are approximately 100m north of Precinct 2, buffered by vegetation and ridgeline. Mitigation Measures for noise and vibration are outlined in section 4.6.

3.5 Air Quality

Dust issues may result from construction activities. Key impacts could include release of pollutants, greenhouse gas emissions, odour emissions, and temporary reduction in amenity. Mitigation Measures for air quality management are outlined in section 4.7.

3.6 Fuel and Chemical Storage

Storage of fuels, chemicals, cleaning products, solvents, oil and other lubricants may be required on site during construction. Impacts associated with fuel and chemical storage include contamination of soil and water, safety hazards to personnel and the public, and odour/air emissions. However, on site fuel storage will be restricted to the appropriate areas at the site compound, and will not impact on Precincts 1 and 2.

3.7 Cultural Heritage

A Cultural Heritage Management Plan has been prepared for the site. No matters of indigenous cultural heritage have been identified within the precinct boundaries. Nonetheless, management of cultural heritage is detailed in Section 4.9.

4 ENVIRONMENTAL MANAGEMENT ACTIVITIES AND CONTROLS

A number of environmental management plans including a detailed construction environmental management plan (CEMP) have been prepared for the construction phase of the project. Each environmental management plan contains mitigation measures relevant to the pre-construction and construction stages of the project. The mitigation measures relevant to the proposed bulk earthworks within Precincts 1 and 2 are detailed below.

4.1 Fauna Management

Table 4: Fauna Management Procedures relevant to Precincts 1 and 2

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 cattle fencing as per the Earthworks Fencing Plan (Appendix B)	Construction Manager/Site Superintendent Sign off: Environmental officer	X		
If contractors are to utilise Boyd Street overpass for site entry, installation of signage at the 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		
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	
Fencing inspections	Environmental Officer/ Site Superintendent		X	
Post-earthworks report to Tweed Shire Council	Environmental Officer		X	
Weekly inspection of construction site/works (Weekly Construction Checklist – Appendix C)	Environmental Officer		X	
Inspection to ensure that operations are leaving the site free draining with no	Environmental Officer		X	

ponding of stormwater.				
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	
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 species identified to DECCW (NPWS)	Environmental Officer	X	X	
No works within 100m of the raptor nests (subject to confirmation of usage)	Project Manager/ Environmental Officer		X	

Earthworks Report

A post-earthworks report will be prepared, detailing:

- Information on earthworks operations, dates, procedures, areas
- Detailed information about any incursion into no-go zones.
- Detailed information regarding any fauna mortality or injury.
- Assessment against the performance criteria detailed in Section 9 of the FMP (SMEC, 2012).
- Recommended remediation measures for any incursions into no-go zones.

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

4.2 Vegetation Management

Table 5: Mitigation Measures for Vegetation Management

Mitigation Measure	Responsibility	Prior to Construction	During Construction
Pre-clearing survey of habitat trees, including flagging and GPS recording	Fauna Spotter Catcher	X	
Parawebbing/exclusion fencing installation around vegetation protection areas/ threatened flora species as per Earthworks Fencing Plan (Appendix B)	Site Superintendent Sign off: Environmental officer	X	
Installation of cattle fencing as per Stage 1 Earthworks Fencing Plan (Appendix B)	Site Superintendent Sign off: Environmental officer	X	
Primary weed control within rehabilitation and management areas at commencement of earthworks in adjacent Development Precincts	Rehabilitation contractor	X	
Installation of erosion and sediment controls to protect vegetation protection areas	Site Superintendent Sign off: Environmental Officer	X	X
Maintenance of protection fencing	Environmental Officer/ Site Superintendent		X
Fencing inspections	Environmental Officer and Site Superintendent	X	X
Notification of additional threatened species to DECCW (NPWS)	Environmental Officer	X	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 Site Superintendent	X	X
Completion of the weekly construction checklist (Appendix C)	Environmental Officer		X
Post-earthworks report to Tweed Shire Council	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

4.3 Groundwater Management

Table 6: 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
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 basins • application of lime to acidic water	Construction Manager / Environmental Officer		X
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.

4.4 Acid Sulphate Soils Management

Table 7: Mitigation Measures for Acid Sulfate Soils

Mitigation Measure	Responsibility	Prior to Construction	During Construction
No ASS and/or PASS shall be stockpiled in overland flow areas.	Site Superintendent / Environmental Officer		X
All stockpiles should have bunded drains surrounding them to allow collection, containment and treatment of surface runoff from the stockpile.	Site Superintendent / Environmental Officer		X
The base of all areas used for stockpiling/ treatment areas and all surrounding bunds and drains shall be treated with a minimum guard layer of 5kg/m^2 of fine Aglime per vertical metre of fill to be placed to neutralise the downward seepage of acidic drainage water. If the soils underlying the stockpile area are not of low permeability (clay) then the placement of a low permeability clay layer or an impermeable membrane may be undertaken to contain any leachate from the ASS/PASS if this is a significant risk to groundwater quality.	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 (if required)	Site Superintendent / Environmental Officer		X
ASS material spills to be cleaned and /or neutralised within 12 hours of occurring	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.

4.5 Contaminated Lands Management

Table 8: Mitigation Measures for Contaminated Lands Management

Mitigation Measure	Responsibility	Prior to Construction	During Construction
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
Imported 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.

4.6 Noise and Vibration Management

Table 9: 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
Ensure that wherever practical, and where sensitive receivers may be affected, piling activities are completed using bored piles.	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
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.	Site Superintendent / Environmental Officer	X	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
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

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.

4.7 Air Management and Dust Control

Table 10: Mitigation Measures for Air and 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	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
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

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.

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

- Air quality monitoring results and comparison to performance criteria;
- 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 and the monitoring program.

4.8 Waste Management

Table 11: 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 of the CEMP) 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 will be analysed and presented.

4.9 Cultural Heritage Management

Table 12: 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	Site Superintendent / Environmental Officer	X	X
Findings of Aboriginal objects or human remains shall follow the outlined procedures within the Management Plan	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.

4.10 Erosion and Sediment Control

Table 13: 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.

4.11 Construction Traffic and Pedestrian Management

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	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
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 works extend beyond daylight hours and adjacent lighting is insufficient to illuminate hazards to workers and non-motorised road users, appropriate temporary lighting shall be installed.	Construction Manager / Site Superintendent		X
Where level differences are significant, suitable barriers which prevent access shall be used.	Construction Manager / Site Superintendent		X

5 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 or 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 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 15 below outlines the monitoring frequencies from each Management Plan relevant to the Bulk Earthworks in Precincts 1 and 2.

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

Table 15: Monitoring

Monitoring Issue	Location	Frequency	Criteria	Person Responsible	Further Detail
Pre- Construction					
Fauna	Overall site	Prior to the commencement of earthworks.	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
Flora	Precincts 1,2,6 and Central Open Space	Once, prior to earthworks	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.	Ecologist/Site Foreman	Refer to VMP.
		Prior to earthworks	Vegetation protection measures included in the Environmental Induction and all workers inducted.	Environmental Officer	Refer to VMP.
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).
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 earthworks activities.	No injury or death of identified fauna during clearing and earthworks	Fauna Spotter Catcher	Refer to FMP
	Work Areas	Weekly	A general inspection completed for fencing associated with fauna. Rectifications reported and completed.	Environmental Officer	Refer to FMP
Flora	Work Areas	During	All threatened flora and retained EEC's are buffered in accordance	Environmental	Refer to VMP

Monitoring Issue	Location	Frequency	Criteria	Person Responsible	Further Detail
		construction	with the VMP and BMP.	Officer	and BMP.
	Work Areas	During construction	• No earthworks 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 earthworks activities	No alterations in drainage impacting on retained vegetation.	Environmental Officer	Refer to VMP.
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 excavation occurs	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 quality criteria include the: • ANZECC 2000 guideline values • Pre-construction levels	Environmental Officer	Refer to Section 9.2 of the GMP (SMEC, 2012).
Stormwater	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).
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 3.7

Monitoring Issue	Location	Frequency	Criteria	Person Responsible	Further Detail
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 3.10
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 3.12 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 ASSMP (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 ASSMP (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 ASSMP (SMEC, 2012).
Traffic and Pedestrian Management	Work Areas	Daily inspection of washing facilities, road traffic & public	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 3.6.

Monitoring Issue	Location	Frequency	Criteria	Person Responsible	Further Detail
		access roads.			
Revegetation and Regeneration Areas	Within Rehabilitation and Management Areas adjacent to Precincts 1 and 2.	Initial monitoring event no more than 6 weeks after primary weed control or planting preparation. Ongoing monitoring annually.	• All Declared noxious weeds effectively and appropriately controlled. • <5% cover of all weeds at the end of the 5 year maintenance period. • Negligible evidence of herbicide damage to native ground covers and native species regeneration. • Sufficient seed collected for propagation requirements of the current project only. • Revegetation areas planted out in general accordance with approved revegetation lists. • At least 1 established woody native plant per square meter throughout revegetation areas. • Increase in the cover of native groundcovers at each annual monitoring event. • For planted rainforest species, an average growth of >1 m after three (3) years, >1.5 m and >70% canopy cover after 5 years. • For planted sclerophyll species, >50% cover after 3 years and >70% cover after 5 years. • >85% survival of stems planted. • Presentable mulch to finish at 100–150 mm deep along visible edges of high profile areas subject to establishment of buffers through revegetation.	Rehabilitation contractor	Refer to SRRMP (SMEC, 2012).

Note: While no fauna survey is proposed within Precincts 1 and 2 for the bulk earthworks phase of the project, annual fauna monitoring is proposed over the entire site, as detailed in the Flora and Fauna Monitoring Program (SMEC, 2012).

REFERENCES

Department of Envirojnment and Conservation (NSW), 2006, Environmental Noise Management – Assessing Vibration: A Technical Guide

JBA Urban Planning. 2008. Environmental Assessment Report Part 3A Concept Plan

JBA Urban Planning. 2009. Environmental Assessment Report Part 3A Project Application

James Warren & Associates. 2008a. Ecological Assessment – Volume 1

James Warren & Associates. 2008b. Vegetation Management Plan

James and Warren & Associates. 2009. Fauna Management Plan

James and Warren & Associates. 2010a. Ecological Assessment Precinct 1 & 2

James and Warren & Associates. 2010b. Ecological Assessment Precinct 6

James and Warren & Associates. 2010c. Revised Regeneration and Revegetation Plan

Place, 2009. Cobaki Lakes Central Open Space Landscape Plan

SMEC. 2011. Long Nosed Potoroo Management Plan

SMEC. 2012a. Acid Sulphate Soils Management Plan

SMEC. 2012b. Buffer Management Plan – Central Open Space and Precincts 1, 2 & 6

SMEC. 2012c. Fauna Management Plan – Central Open Space and Precincts 1, 2 & 6

SMEC. 2012d. Groundwater Management Plan – Central Open Space and Precincts 1, 2 & 6

SMEC. 2012e. Flora and Fauna Monitoring Program

SMEC. 2012f. Site Regeneration and Rehabilitation Management Plan – Central Open Space and Precincts 1, 2 & 6

SMEC. 2012g. Vegetation Management Plan – Central Open Space and Precincts 1, 2 & 6

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

Location and Extent of Earthworks

The bulk earthworks proposed, including locations of areas of cut and fill are illustrated in the following series of drawings.

In accordance with the project approval MP 08_020 (as per drawing YC0029-1P1-SK02), areas of development precincts 1, 2 and 11 are the identified sources of fill material required for the Central Open Space earthworks.

ROAD No. 2
ROAD No. 16
ROAD No. 1
STAGE 2B
TEMPORARY SEDIMENT BASIN AND FUTURE BIO-RETENTION BASIN.
ROAD No. 7
LW No. 1
LOOP ROAD
STAGE 2E
STAGE 2G
ROAD No. 2
ROAD No. 5
STAGE 2C
ROAD No. 3
ROADS, FIRE TRAILS AND LOT LAYOUT ARE INDICATIVE ONLY AND ARE SUBJECT TO SEPARATE APPROVAL OF PRECINCTS 1 & 2 CONSTRUCTION CERTIFICATE.
P2-B FIRE TRAIL
STAGE 2A
ROAD No. 1
ROAD No. 2
P2-C FIRE TRAIL
LW No. 3
TEMPORARY SEDIMENT BASIN AND FUTURE BIO-RETENTION BASIN.
TEMPORARY SEDIMENT BASIN AND FUTURE BIO-RETENTION BASIN.
DRAIN 7
STAGE 2I
FOR CONTINUATION REFER TO SHEET 1

FOR EARTHWORKS SECTIONS REFER DRAWING YC0229-1E1-ES04 & ES05

LEGEND

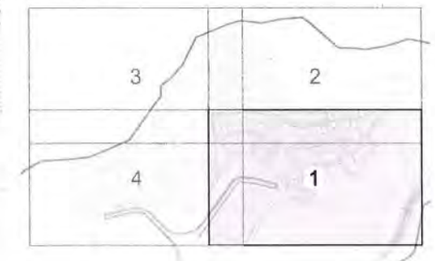
- PROPOSED SURFACE CONTOURS
- TOP/TOE OF BATTER
- OPEN DRAIN
- CUT (BORROW MATERIAL)
- PRECINCT BOUNDARY

BULK EARTHWORKS NOTES

1. ALL EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH T.S.C. STANDARD SPECIFICATIONS.
2. ALL EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH AS3798 UNDER LEVEL 1 SUPERVISION.
3. ALL NEW WORKS TO MATCH NEATLY WITH EXISTING. THE CONTRACTOR SHALL CONFIRM LOCATION OF ALL EXISTING SERVICES AND PROTECT THESE SERVICES DURING CONSTRUCTION. DAMAGED SERVICES SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.
4. ALL OF THE SITE SHALL BE KEPT FREE DRAINING DURING ALL PHASES OF THE PROJECT.
5. MINIMUM TOPSOIL THICKNESS 100mm
6. UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT ALL FILL SHALL BE PLACED AT BETWEEN +2% AND -2% OF OPTIMUM MOISTURE CONTENT.

KEY SHEET PLAN

NOT TO SCALE



STATUS: COUNCIL SUBMISSION — FOR APPROVAL

REV	DESCRIPTION	DRAWN	DATE
B	RESPONSE TO 3rd PARTY SWMP REVIEW	H.W.	18.10.12
A	ORIGINAL ISSUE	G.S.	04.05.12

DRAWING IS NOT TO BE SCALED

SCALE (AT ORIGINAL SHEET SIZE): 10 0 10 20 30 40 50 — 1:1000

ORIGINAL SHEET SIZE: A1

CLIENT: LEDA MANORSTEAD Pty Ltd

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

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TITLE: PRECINCT 1 & 2 BORROW AREA EARTHWORKS PLAN SHEET 1 OF 4

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

APPROVED RPEQ No 7817

DRAWING NUMBER: YC0229-1E1-EW09 REVISION: B

FOR LEGEND AND NOTES REFER TO SHEET 1
AND FOR EARTHWORKS SECTIONS REFER
DRAWING YC0229-1E1-ES04 & ES05

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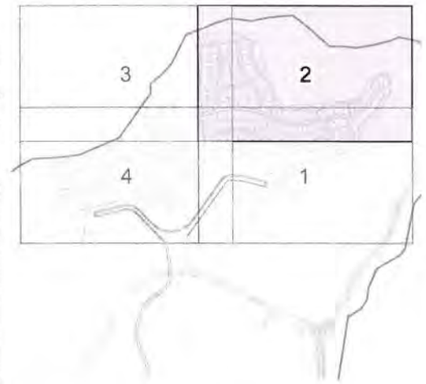

STAGE 2E

ROAD No. 7

ROAD No. 8

ROAD No. 9

ROAD No. 2

ROAD No. 1

ROAD No. 16

P2-B FIRE TRAIL

STAGE 2D

STAGE 2B

MT WOODGEE
STAGE 2H

ROADS, FIRE TRAILS AND LOT LAYOUT ARE INDICATIVE ONLY AND ARE SUBJECT TO SEPARATE APPROVAL OF PRECINCTS 1 & 2 CONSTRUCTION CERTIFICATE.

STAGE 2G

STAGE 2F

STAGE 2C

ROAD No. 5

ROAD No. 7

STATUS	COUNCIL SUBMISSION	FOR APPROVAL		
B	RESPONSE TO 3rd PARTY SWMP REVIEW	H.W.	18.10.12	
A	ORIGINAL ISSUE	G.S.	04.05.12	
REV	DESCRIPTION	DRAWN	DATE	

DRAWING IS NOT TO BE SCALED

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ORIGINAL SHEET SIZE A1

CLIENT
LEDA MANORSTEAD Pty Ltd

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

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TITLE
PRECINCT 1 & 2 BORROW AREA
EARTHWORKS PLAN SHEET 2 OF 4

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

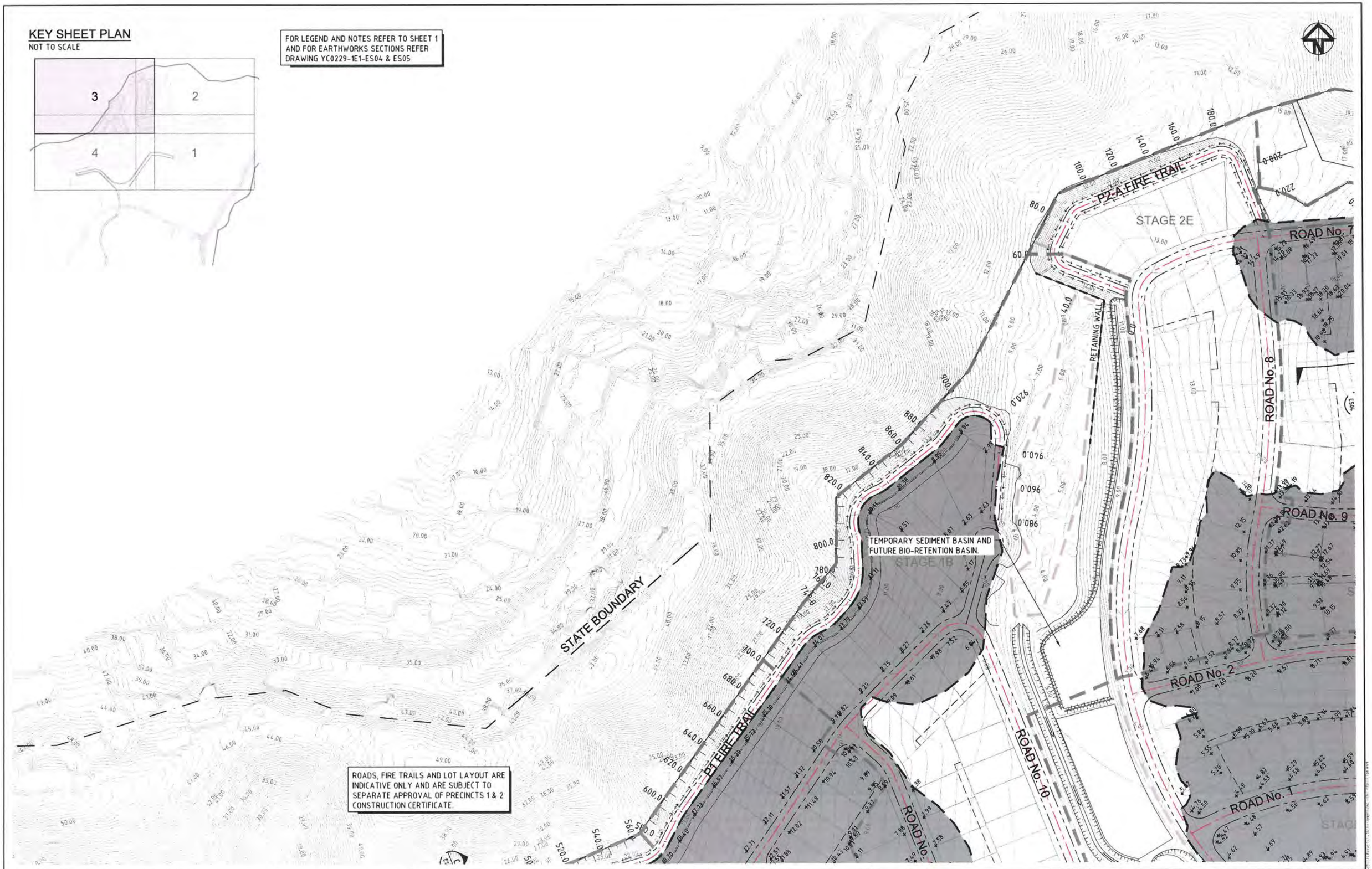
APPROVED RPEQ No 7817

DRAWING NUMBER YC0229-1E1-EW10 REVISION B

KEY SHEET PLAN

NOT TO SCALE

FOR LEGEND AND NOTES REFER TO SHEET 1 AND FOR EARTHWORKS SECTIONS REFER DRAWING YC0229-1E1-ES04 & ES05



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B	RESPONSE TO 3rd PARTY SWMP REVIEW	H.W.	18.10.12
A	ORIGINAL ISSUE	G.S.	04.05.12
REV	DESCRIPTION	DRAWN	DATE

DRAWING IS NOT TO BE SCALED

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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

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TITLE: PRECINCT 1 & 2 BORROW AREA
EARTHWORKS PLAN SHEET 3 OF 4

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

APPROVED RPEQ No 7817

DRAWING NUMBER YC0229-1E1- EW11 REVISION B

KEY SHEET PLAN

NOT TO SCALE

FOR LEGEND AND NOTES REFER TO SHEET 1 AND FOR EARTHWORKS SECTIONS REFER DRAWING YC0229-1E1-ES04 & ES05

ROADS, FIRE TRAILS AND LOT LAYOUT ARE INDICATIVE ONLY AND ARE SUBJECT TO SEPARATE APPROVAL OF PRECINCTS 1 & 2 CONSTRUCTION CERTIFICATE.

ROAD No. 2
ROAD No. 1
ROAD No. 7
ROAD No. 10
ROAD No. 12
ROAD No. 14
ROAD No. 13
ROAD No. 11
ROAD No. 15
LOOP ROAD
LW No. 4
LW No. 2
P1 FIRE TRAIL
P2 FIRE TRAIL
STAGE 1D
STAGE 1A
STAGE 2I
TEMPORARY SEDIMENT BASIN AND FUTURE BIO-RETENTION BASIN.
TEMPORARY SEDIMENT BASIN AND FUTURE BIO-RETENTION BASIN.
TEMPORARY SEDIMENT BASIN AND FUTURE BIO-RETENTION BASIN.
MINOR OPEN DRAIN 7
MINOR OPEN DRAIN 6
MAJOR CENTRAL OPEN DRAIN

STATUS	COUNCIL SUBMISSION	FOR APPROVAL	
B	RESPONSE TO 3rd PARTY SWMP REVIEW	H.W.	18.10.12
A	ORIGINAL ISSUE	G.S.	04.05.12
REV	DESCRIPTION	DRAWN	DATE

DRAWING IS NOT TO BE SCALED

SCALE (AT ORIGINAL SHEET SIZE) 10 0 10 20 30 40 50 SCALE 1:1000

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

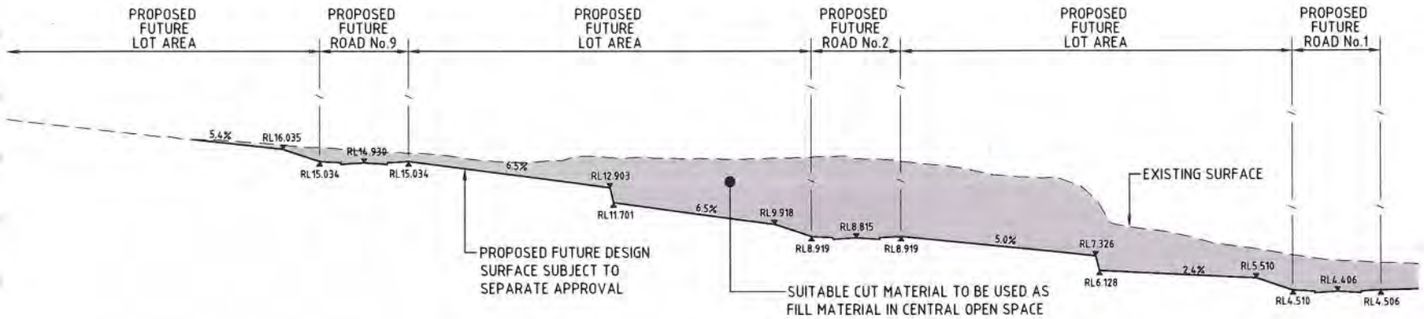
YEATS CONSULTING ENGINEERS
LEVEL 1, 193 FERRY ROAD SOUTHPORT QLD 4215 AUSTRALIA
T 07 5571 2232 F 07 5503 1672 info@yeats.com.au www.yeats.com.au

TITLE: PRECINCT 1 & 2 BORROW AREA
EARTHWORKS PLAN SHEET 4 OF 4

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

APPROVED RPEQ No 7817

DRAWING NUMBER YC0229-1E1-EW12 REVISION B



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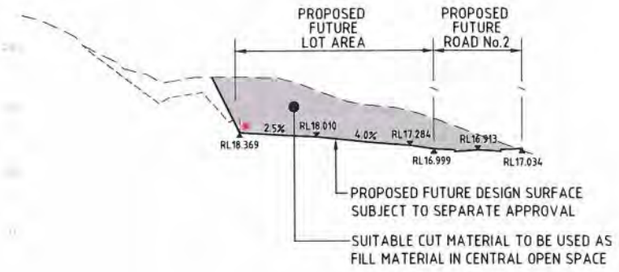
EW10



SECTION B
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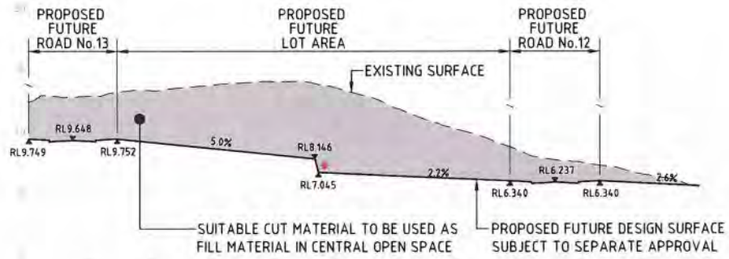
SCALE 1:250 v
EW10



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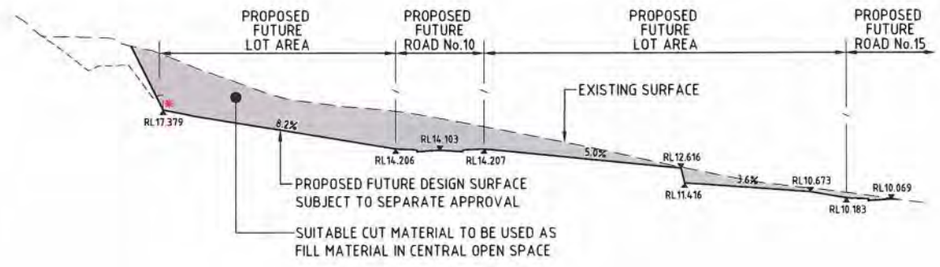

SECTION C
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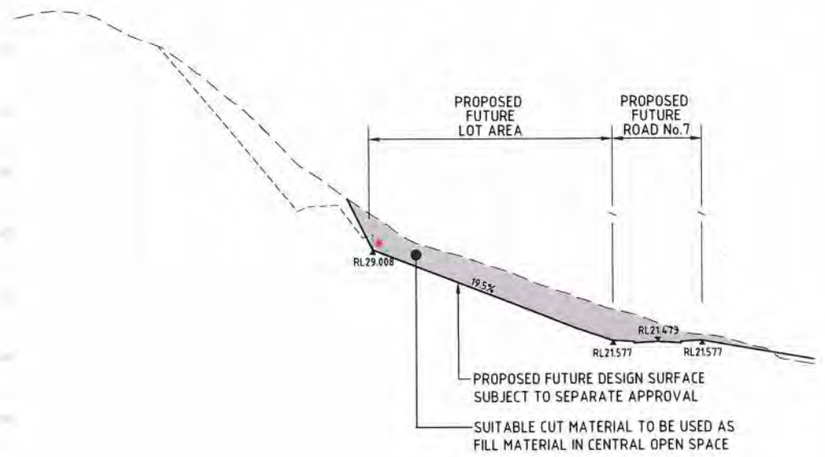

SECTION A
SCALE 1:500 h
SCALE 1:250 v
EW10

NOTE

* CONTRACTOR TO APPLY A TEMPORARY 1 in 1 BATTER AT THIS LOCATION DURING BULK EARTHWORKS PHASE.

STATUS	COUNCIL SUBMISSION	FOR APPROVAL	
B	RESPONSE TO 3rd PARTY SWMP REVIEW	H.W.	18.10.12
A	ORIGINAL ISSUE	G.S.	04.05.12
REV	DESCRIPTION	DRAWN	DATE

DRAWING IS NOT TO BE SCALED

SCALE (AT ORIGINAL SHEET SIZE): AS SHOWN

ORIGINAL SHEET SIZE: A1

CLIENT: LEDA MANORSTEAD Pty Ltd

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

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TITLE: PRECINCT 1 & 2 BORROW AREA EARTHWORKS SECTIONS SHEET 1 OF 1

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

APPROVED RPEQ No 7817

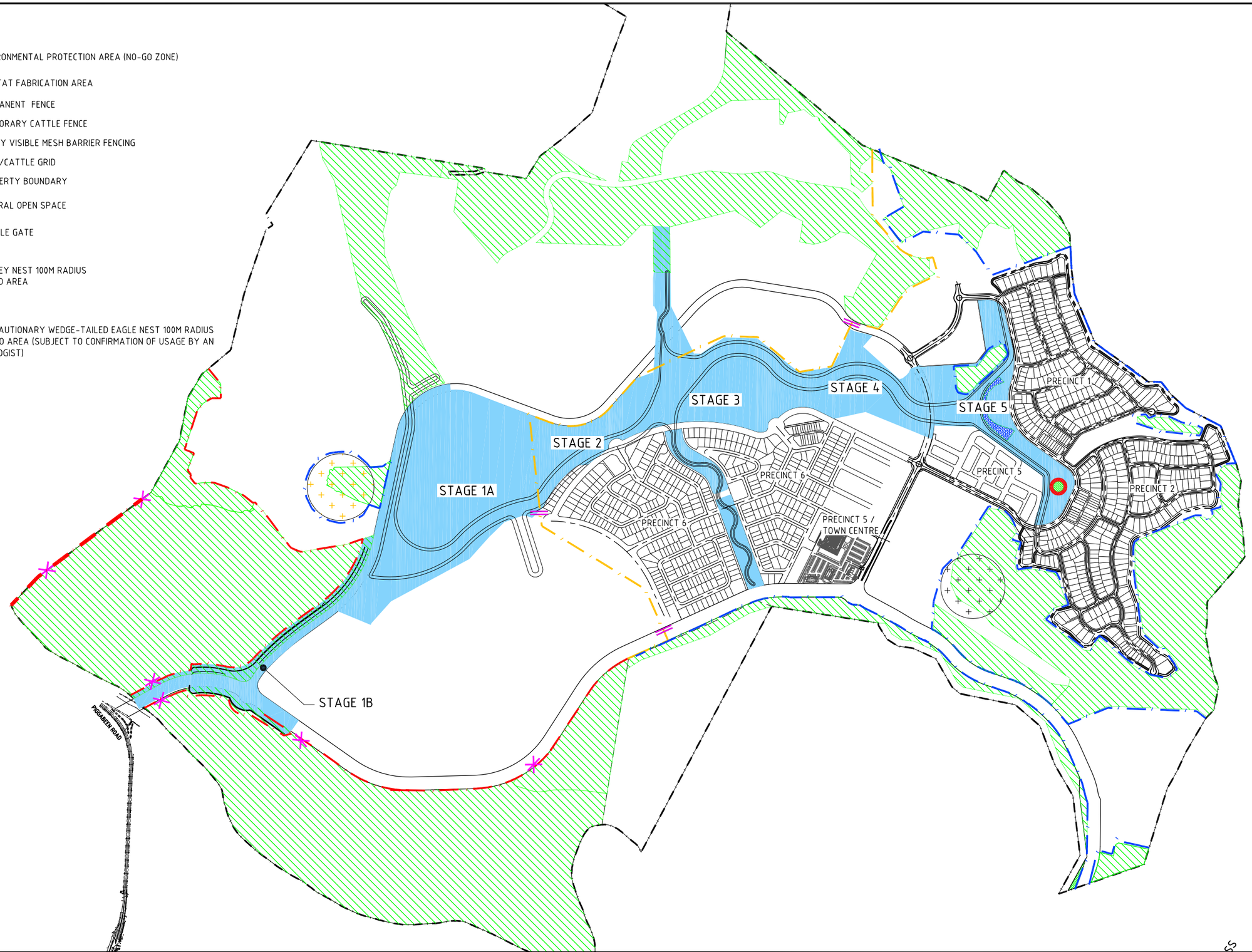
DRAWING NUMBER: YC0229-1E1- ES04

REVISION: B

APPENDIX B – EARTHWORKS FENCING PLAN

LEGEND

- ENVIRONMENTAL PROTECTION AREA (NO-GO ZONE)
- HABITAT FABRICATION AREA
- PERMANENT FENCE
- TEMPORARY CATTLE FENCE
- HIGHLY VISIBLE MESH BARRIER FENCING
- GATE/CATTLE GRID
- PROPERTY BOUNDARY
- CENTRAL OPEN SPACE
- VEHICLE GATE
- OSPREY NEST 100M RADIUS NO-GO AREA
- PRECAUTIONARY WEDGE-TAILED EAGLE NEST 100M RADIUS NO-GO AREA (SUBJECT TO CONFIRMATION OF USAGE BY AN ECOLOGIST)



REVISION		DATE	DES/DFT	APP'D
E	Fencing Amended	30.10.12	SS/ES	
D	Fencing Amended	10.10.12	SS/JF	
C	Fencing Amended	08.10.12	SS/JF	
B	Fencing Amended	27.08.12	SS/JF	
A	Issued for Approval	08.08.12	SS/JF	

LEDA

Principal
Leda Developments
Suite 14, Level 1, 46 Cavill Avenue
Surfers Paradise

Project Leader
S.Sandford
Designed
S.Sandford
Drawn
J.Flynn
Checked

Authorised

Date
September 2011

N

Scale @ A1

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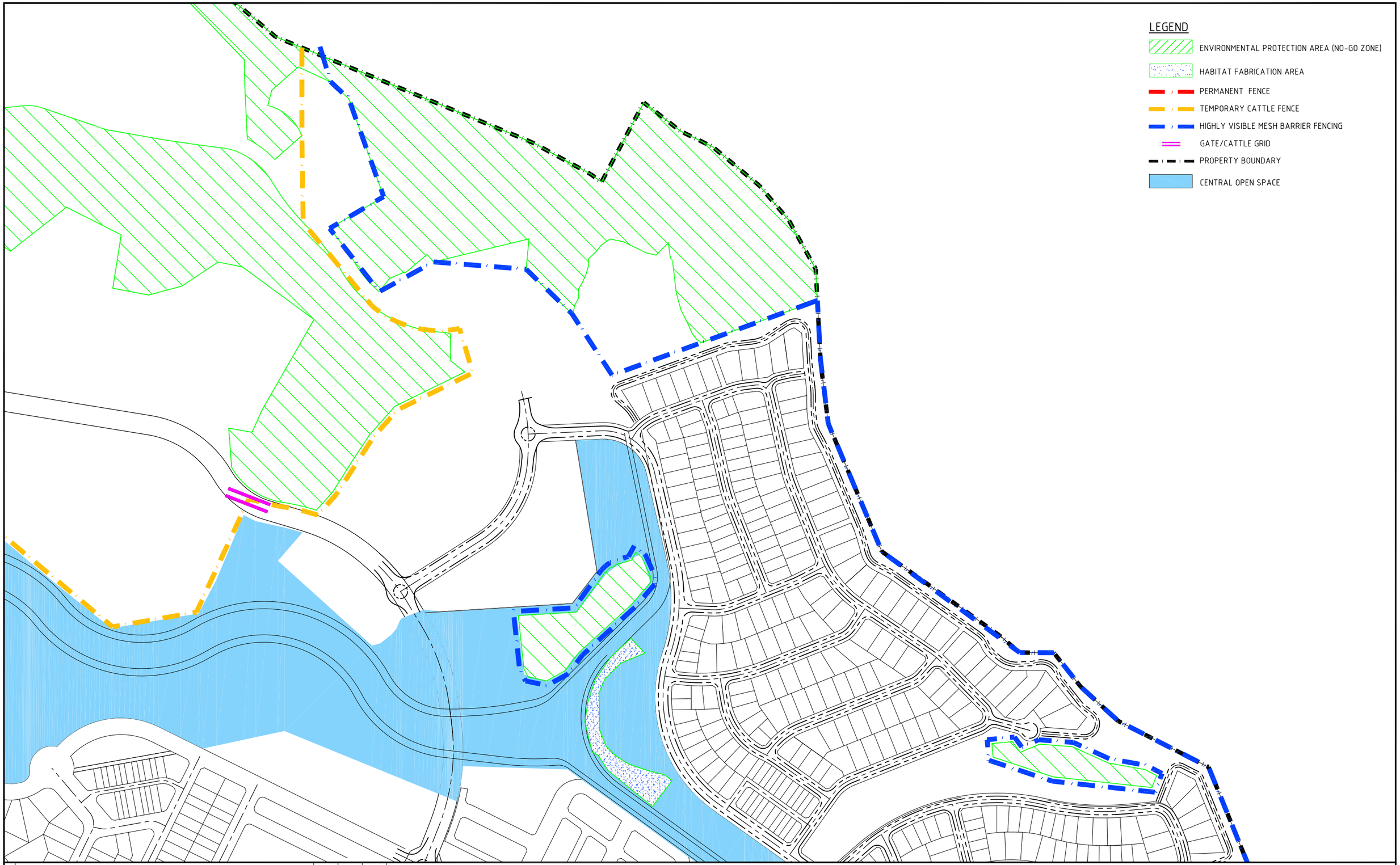
COBAKI ESTATE

OVERALL
Tweed Shire Council
COVER SHEET
Stage 1 Earthworks Fencing Plan
Drawing No. 3310071E-034 **Rev E**

Sheet No. 1 of 7

Subject to Approval
Not to be used for construction



REVISION		DATE	DES/DFT	APP'D
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Checked

Authorised

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September 2011

Scale @ A1
1:2000
0 20 40 80

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COBAKI ESTATE
OVERALL
Tweed Shire Council
Environmental Protection/No-Go Zones
Stage 1 Earthworks Fencing Plan
Drawing No. 3310071E-035 **Rev E**

Subject to Approval
Not to be used for construction

LEGEND

- ENVIRONMENTAL PROTECTION AREA (NO-GO ZONE)
- HABITAT FABRICATION AREA
- PERMANENT FENCE
- TEMPORARY CATTLE FENCE
- HIGHLY VISIBLE MESH BARRIER FENCING
- GATE/CATTLE GRID
- PROPERTY BOUNDARY
- CENTRAL OPEN SPACE
- OSPREY NEST 100M RADIUS NO-GO AREA
- VEHICLE GATE

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REVISION		DATE	DES/DFT	APP'D

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Designed
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Drawn
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Checked

Authorised

Date
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1:2000
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COBAKI ESTATE
OVERALL
Tweed Shire Council
Environmental Protection/No-Go Zones
Stage 1 Earthworks Fencing Plan
Drawing No. 3310071E-036 **Rev E**

Sheet No. 3 of 7

Subject to Approval
Not to be used for construction

APPENDIX C – WEEKLY INSPECTION CHECKLIST

Inspection Date:	Area/Precinct:

WEEKLY CONSTRUCTION CHECKLIST

#	Control Measure	Yes	No	N/A	Comments/Corrective Action
1	Is drainage from the project site being directed through necessary controls prior to entering any watercourse?				
2	Is vegetation being protected with Environmental Protection Zones?				
3	Is the integrity of the delineation fencing along the Environmental Protection Zone buffer satisfactory?				
4	Are fauna structures (koala posts and nest boxes) in place?				
5	Have hollows been salvaged for re-use?				
6	Have hollows been inspected by the fauna specialist?				
7	Has the area been inspected for threatened fauna?				
8	Has flora monitoring been undertaken?				
9	Is monitoring of water quality being undertaken?				
10	Is riparian and wetland monitoring being undertaken?				
11	Are disturbed areas being rehabilitated as soon as practical?				
12	Are suitable sedimentation and erosion control devices in place where necessary?				
13	Are protected areas being protected from sediment and erosion impacts?				
14	Are areas surrounding waterways satisfactorily stable?				
15	Is there evidence to suggest changes should be made to the site induction relating to flora and fauna aspects? (i.e. reoccurring issues, prevention measures, etc)				
16	Have any injuries or death to wildlife been identified or reported?				
17	Have any weed infestations been identified?				
18	Any other issues to add to the checklist?				
Completed by:		**Signature:**			